APPENDIX A

TITLE: LIVEEXCEPTION SYSTEM

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NETWORK HEALTH®

Customizing Variables

Developer Program

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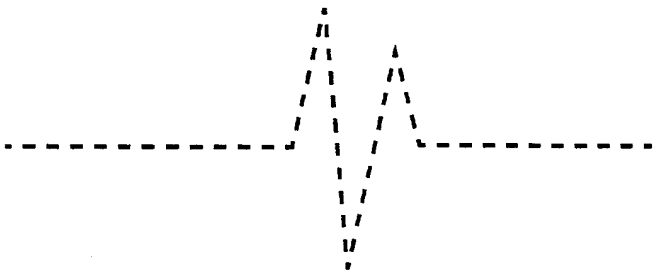

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About Network Health Variables

Network Health uses a proprietary technology called the *management information base (MIB) translation file* (MTF). This technology allows Network Health to normalize data collected from standard and proprietary agents available from multiple vendors. By normalizing data, Network Health can reliably analyze data collected from different agents and vendors and display it in the same report using a standard set of labels.

About MIB Translation Files

For each type of element (such as Ethernet, Frame Relay, Asynchronous Transfer Mode (ATM), remote access devices, routers, and servers), Network Health assigns a set of variables to columns in the database. To make those assignments, it requires an MTF for each element that is to be polled at a device. For example, if the Simple Network Management Protocol (SNMP) agent at a device supports Ethernet, Fiber Distributed Data Interface (FDDI), Token Ring, and Frame Relay, Network Health requires an MTF for each element type.

Each MTF identifies the associated MIB and its filename, an agent for this element type, and a set of statements that map MIB variables to the appropriate database column. When an element is discovered, Network Health assigns the appropriate agent type to it. Network Health polls for data for the variables defined in the MTF only.

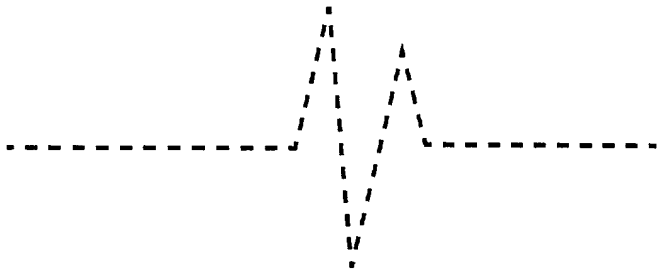
With an MTF, Network Health specifies only those MIB attributes used to generate reports. Often the information required for analysis exists in either a subset of a MIB table or in multiple MIB tables in the agent. Using an MTF, Network Health can combine data from different tables in the MIB that are indexed in the same way. In addition, an MTF can combine standard MIB information with proprietary extensions in a single poll.

Using the MTF technology, you can request that Network Health poll devices for specific variables, define the mapping to database columns for those variables, create the type of labels that you want to appear in reports, and run Trend reports on your variables. Refer to Chapter 2, "Creating an MTF," for instructions.

About Report Labels

For each element type, Network Health establishes a set of variable labels. A label is associated with each database column based on the element type. When you run Network Health, it displays the correct labels in reports and in lists for selecting variables on which to run Trend reports.

After creating an MTF, you can associate your variables with labels provided by Network Health or labels that you create. Network Health provides ASCII files that you can modify to create your own labels. Refer to Chapter 3, "Adding Variable Labels," for instructions.



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Creating an MTF

To create an MTF, you must do the following:

1. Construct the MTF.
2. Create a compiled MIB.
3. Add the agent that is assigned to the MTF to Network Health.
4. Restart the Network Health server.

This chapter describes each of these steps in detail.

Constructing the MTF

An MTF describes the mapping of data from a source (such as a MIB, or data imported from a database data information (DDI) file) to the columns in the Network Health database. To construct an MTF, you can either edit an existing MTF to add your mappings or write a new MTF.

If you edit an existing MTF, every time you reinstall or upgrade Network Health, the installation process copies to the *nethealth/*changed directory any MTFs and compiled MIBs that you modified. You must copy them back to the poller directory. If you write a new MTF, reinstalling or upgrading Network Health does not affect your MTFs or compiled MIBs.

Network Health supports using indexes to access MIB variables. It only collects statistical data that is a counter or a gauge. This section describes assigning indexes to variables and how to define your data as either a counter or a gauge.

Writing an MTF

An MTF is an ASCII text file that uses nested statements (enclosed in braces) to define the set of attributes to use. It begins with the keyword mib and the name of the MIB being translated. Generally, you should use the name of the MIB as part of the MTF filename.

The MTF includes nested statements for the following types of information: support, data source, and translation. The following is a sample mib2.mtf file:

```
mib mib2
{
    file mib2.mib
    version 2
    agent "MIB2 (wan port)"
    translation
    {
        mediaType = -100
        mediaSpeed = ifSpeed%
        operStatus = ifOperStatus%
        operStatusLastChange = ifLastChange%
        variable1 = ifInUcastPkts + ifInNUcastPkts +
ifInErrors + ifInDiscards + ifInUnknownProtos
        variable2 = ifInOctets
        variable3 = ifInNUcastPkts
        variable4 = ifInNUcastPkts + ifOutNUcastPkts
        variable10 = ifInErrors
        variable9 = ifInDiscards
        variable16 = ifInUnknownProtos
        variable22 = ifInUcastPkts + ifInNUcastPkts +
ifOutUcastPkts + ifOutNUcastPkts + ifInErrors + ifInDiscards
+ ifInUnknownProtos
        variable23 = ifInOctets + ifOutOctets
        variable24 = ifInErrors + ifOutErrors
        variable25 = ifInDiscards + ifOutDiscards
    }
}
```

NOTE

To create your own MTF, you can copy and rename an existing MTF.

Support Information

The support information section includes the following variable statements:

```
file mibFilename
version number
aggregateOnly value
agent "agentTextString"
```

Each variable is required and must have the appropriate value, as defined in Table 2-1.

Table 2-1: Support Information

Variable	Definition
file	The filename for the MIB being translated by this MTF. The corresponding *filename*.pcm file must reside in the poller directory of the Network Health installation.
version	The number of the MTF format. Only the value 2 is supported.
aggregateOnly	Indicates whether the element is a form of parent element that is not polled but exists for reporting and aggregation purposes. The default value is no. If set to yes, this statement indicates that the element is not polled, but it is used to collect aggregate data for children elements. Modem pools are an example of this type of element.
agent	The text for the agent that appears in the Poller Configuration dialog box. You must create a unique string for your MTF.

Data Source Information

The dataSourceInfo section of an MTF provides information concerning response elements (response paths). The data source information begins with the dataSourceInfo keyword followed by an open brace on a new line as follows:

```
dataSourceInfo
{
```

This section contains three variable statements in the following format:

```
dataSourceType dataSourceType
presVarListName presVarListName
protocol protocol
```

Each statement must occupy a single text line. These statements are required and must have the appropriate value.

The first variable, dataSourceType, indicates the kind of data that Network Health should expect to collect from the polled device. Using this variable, Network Health distinguishes among the protocol measurement capabilities of various kinds of routers. For data import purposes, you should set the value to NotApplicable.

The second variable, presVarListName, represents the value of the keyword in *nethealth*/poller/protocols.vars, which defines the data fields from which this MTF file is expected to extract necessary configuration information. Using this variable, Network Health determines which parameter variables are applicable to various kinds of routers. For data import purposes, you should set the value to *genericResponsePath*.

The last variable in the dataSourceInfo section, protocol, defines the protocol measured by elements of this type. This variable controls the protocols that you view in Network Health reports. Table 2-2 lists the valid values for each supported protocol.

Table 2-2: Supported Protocols for dataSourceInfo

Protocol	Value
Ping	ICMP
UDP	UDP
DNS	domain
HTTP	www-http
TCP Connect	TCP
Jitter	Jitter
Sybase SQL	sybase
Oracle SQL	orasrv
Microsoft SQL	ms-sql-s
SAP-R3	sap-r3

Table 2-2: Supported Protocols for dataSourceInfo (Continued)

Protocol	Value
Oracle Forms	oraforms
Lotus Notes	lotusnote
Microsoft Exchange	msexch-routing
PeopleSoft	peoplesoft
Citrix	ica
Mail (POP3)	pop3
Mail (SMTP)	smtp
Other Network Protocol	other-net
Other Application Protocol	other-app
Telnet	telnet
FTP	ftp
Other SQL	other-sql
Network News (NNTP)	nntp

Translation Information

The translation information section begins with the translation keyword followed by an open brace on a new line as follows:

```
translation
{
```

In the translation section, statements identify required information and map one or more MIB variables to a database column. The variable statements follow this format:

```
mtfVariable = expression
```

Each statement must occupy a single text line. Table 2-3 lists the variables used in the translation information section and their valid values .

Table 2-3: Translation Information

Variable	Definition
mediaType	Specifies the type of element. This is required. If you are using an existing element type, specify one of the following values: 6 Ethernet LAN -1 Token Ring LAN -2 MIB2 LAN -100 WAN -101 Frame Relay -102 MDBS -105 ATM Port -106 ATM Path -107 ATM Channel -200 Router -201 Router with Cache -250 Router CPU -251 Router CPU with Cache -300 Server -301 Server with no Virtual Memory -302 Server with no Memory -303 BMC Windows NT Server -304 BMC UNIX Server -305 Empire Windows NT Server -306 Empire UNIX Server -330 Server CPU -350 User Partition -352 BMC Windows NT Partition -353 BMC UNIX Partition -370 Server Disk -371 BMC Server Disk -502 Server MIB2 LAN -600 Server WAN -700 Modem -701 ISDN interface -725 Remote access server (RAS) -750 RAS CPU -775 Modem pool

Table 2-3: Translation Information (Continued)

Variable	Definition
mediaType (continued)	-800 Network path -801 Network path for voice over IP -802 Network path for application protocols -803 Network path element identifier for FirstSense -805 Network path element identifier for Empire Service Response -1000 Traffic Accountant probe -3000 System Partition -3001 BMC Windows NT System Partition -3002 BMC UNIX System Partition -3100 UNIX Process Set -3101 Windows NT Process Set -3200 UNIX Process Set Excluded -3201 Windows NT Process Set Excluded -3300 UNIX Process -3301 Windows NT Process If you create a new element type, select a value from the following ranges: -50 to -99 LAN -150 to -199 WAN -225 to -249 Router -275 to -299 Router CPU -315 to -329 Server -340 to -349 Server CPU -360 to -369 Server partition -385 to -399 Server disk -713 to -724 Modem/ISDN -738 to -749 RAS -763 to -774 RAS CPU -788 to -799 Modem pool -850 to -899 Network path -3050 to -3099 Server system partition -3150 to -3199 Server process set -3250 to -3299 Server excluded process set -3350 to -3399 Server system partition You must include the minus sign (-) for all element types other than Ethernet.

Table 2-3: Translation Information (Continued)

Variable	Definition
mediaSpeed	Specifies what the poller uses to obtain the interface speed. This is required. For full-duplex interfaces, this is the incoming interface speed. You can specify the speed as a value in bits per second or as the MIB variable. If the speed is in units other than bits per second, you must convert it in this statement. You should designate this as a gauge by including a percent sign (%).
mediaSpeedOut	Specifies what the poller uses to obtain the outgoing interface speed. This is used only for full-duplex interfaces. You can specify the speed as a value in bits per second or as the MIB variable. If the speed is in units other than bits per second, you must convert it in this statement. You should designate this as a gauge by including a percent sign (%).
operStatus	Specifies the MIB variable (such as ifOperStatus) the poller uses to obtain the interface operational status. This is optional. You should designate it as a gauge by including a percent sign (%). Network Health interprets data for this variable based on the ifOperStatus enumeration from MIB.
operStatusLastChange	Specifies the MIB variable the poller uses to obtain the last operational status change. This is optional and should be designated as a gauge by including a percent sign (%). Network Health interprets data for this variable based on the ifLastChange enumeration from MIB2.
sysUpTime	Specifies the MIB variable that the poller uses to obtain the system uptime. This is optional and should be designated as a gauge by including a percent sign (%).
availableTime	Specifies the amount of time in seconds that the element is available for the duration of the current polling interval. If this variable is present, the availability data will be based on this value rather than calculations based on ifOperStatus, ifLastChange, and sysUpTime.
reachableTimeSec	Specifies the sum of the response time, the amount of time in seconds that the element was reachable.

Table 2-3: Translation Information (Continued)

Variable	Definition
latencyMsec	Specifies the time in milliseconds that it took for the roundtrip delay to reach the element.
totalTime	Specifies the total amount of time during which the element was polled. For data import purposes, the totalTime and deltaTime variables are equivalent.
variable*N*	Specifies the actual MIB variable or variables to be mapped to the column identified as variable1 through variable30.

Rules Concerning the Creation of MTFs

When creating an MTF, keep in mind the following:

- When specifying the mediaSpeed variable for any element that does not support the concept of speed (such as a router or server disk), you must specify zero (0). Do not leave the value blank.
- You must include every MIB variable for which you want data collected, not just your specific variables.
- Before you specify a variable*N*, make sure that it is available for your use. Refer to Appendix A for a list of column assignments for variables.
- The variables that you select to include in the MTF must be indexed in the same way.
- You can specify only the following operators in the MTF: plus (+), minus (-), multiply (*), and divide (/).
- Both the translation information and the MTF must end with a close brace (}), preferably on a new line.

NOTE

You must have **two** close braces (}) at the end of the file.

Using Indexes to Access Variables

Network Health supports up to four indexes in the poller configuration. You can use these indexes to access your variables by appending the index number to the MIB variable name. For example, if you wanted to access the ifInOctets variable at index 12, you might specify the following:

```
variable28 = ifInOctets.12
```

Indexes do not have to be constants. Network Health supports the notation $1, $2, $3, or $4 to indicate an index as defined in the poller configuration. For example, if index 1 in the poller configuration is index 12, you might specify the following:

variable28 = ifInOctets.$1

Network Health assumes index1 if you do not include an index with the variable name. The following statement is identical to the one described previously:

variable28 = ifInOctets

If your MIB variable does not support indexes, you must append a zero to the variable name. For example:

variable30 = bufferNoMem.0

NOTE

The index number does not imply order of use.

Using Counters and Gauges

Network Health only collects statistical data on two data types: counters and gauges. A counter is a non-negative integer which monotonically increases until it reaches a maximum value, after which it wraps around and starts increasing again from zero. A gauge is a non-negative integer which may increase or decrease. By default, Network Health assumes that the data type for a variable is a counter unless you indicate that it is a gauge by appending a percent sign (%) to the variable.

Network Health does not handle counters and gauges in the same way. Each time that it polls a counter, it subtracts the value of that counter in the previous poll interval from its value in the current poll interval to obtain a counter difference, which it stores in the database. It subsequently divides the database value by the polling interval to obtain a rate.

In contrast, when Network Health polls a gauge, it stores the gauge directly in the database without performing a subtraction. When polling a report gauge, it subsequently divides the report gauge by the poll period. When polling a calculation gauge, it does not multiply the calculation gauge by the poll interval.

When collecting data for a gauge, you must normalize it to a counter before Network Health can store it in the database. This is a requirement for the database rollups. To normalize a gauge to a counter, you must multiply the value returned for the variable by the time between the last poll and the current poll, which is represented by the deltaTime MTF variable, divided by 100. For any variable that specifies a gauge for a data type, you express that variable as follows:

```
gaugeVariable% * (deltaTime / 100)
```

The deltaTime MTF variable is expressed in centiseconds, and the database requires units in seconds.

Using Function Call Syntax in an MTF Expression

The MTF expression language supports function call syntax. Functions have the following format:

```
functionName (arg1, ..., argn)
```

MTFs support the following defined functions:

- round
- switch
- constArrayMap
- counter64
- nwbCounter64
- snmpCounter64
- useWrappedValue
- isAggregated
- min
- max
- null data

The round Function

The round function has the following syntax:

```
round (x)
```

The value of *x* is a variable. This function rounds the value of *x* to the nearest integer. For example:

- round (22.2) = 22
- round (22.87) = 23
- round (42.5) = 43

The switch Function

The switch function has the following syntax:

```
switch (x, d1, r1, ..., dn, rn)
```

The values of *x*, *dl*, and *rl* may be any expressions. This function is a general quality-based conditional. It evaluates *x* and compares the result for equality with the evaluated values of *d1*, *d2*, and so on, in succession, until it finds a match. When it finds a match, the switch function returns the evaluated value ri (r1, r2, and so on). If it does not find a match, it returns 0.

The constArrayMap Function

The constArrayMap function has the following syntax:

```
constArrayMap (x, c0, c1, ..., cn-1)
```

This function maps one set of values to another set of variable values. It truncates the value of *x* to an integer, if necessary, and uses the integer value as an index to the set of constants shown as *c0*, *c1*, up to *cn-1*. The *c* values must be constants. The function checks these values when the MTF is parsed and returns *c[x]*.

NOTE

You must have a constant for each possible value of *x*; otherwise, Network Health generates a runtime error. If *x* is not in the domain from 0 to n-1, the result is 0.

For example:

variable = constArrayMap(x,12,4,7,22,40)

When *x* is 0.25, the function truncates the value to 0. The 0 index value in the constant array is 12; thus, the *variable* value evaluates to 12. When x is 1, the value is 1. The 1 index value in the array is 4; thus, the *variable* value evaluates to 4.

The counter64 Function

The counter64 function has the following syntax:

```
counter64 (hi, lo)
```

The value of *hi* is the high 32 bits of a 64-bit counter value and the value of *lo* is the low 32 bits of a 64-bit counter value.

Network Health obtains the high and low portions of the 64-bit counter from different MIB variables and concatenates them to form a single 64-bit value. It then uses this value to calculate deltas (without loss of precision). As with 32-bit counters, Network Health checks the wrap. If it detects a delta greater than half the word resolution (in this case, a delta greater than $2^{63} - 1 =$ 9223372036854775807), it generates a wrap error.

The nwbCounter64 Function

The nwbCounter64 function has the following syntax:

```
nwbCounter64 (x)
```

The value of *x* must be a variable. This function interprets the value of *x* as a Newbridge octet-string based 64-bit counter. In contrast to the snmpCounter64 function, you must use this function to denote this type of counter. Since the use of an octet string as a counter is nonstandard, if the type is not octet-string—and a Newbridge 64-bit counter is the variable to which the value is to be bound—the poller checks the returned SNMP type in the response packet and generates an error.

The setSnmpVersion Function

The setSnmpVersion function sets the SNMP version of the packets sent by the poller. By default, all packets are SNMP version 1. If your device requires a different SNMP version, you can use the setSnmpVersion function to specify it in the MTF file for the device.

The setSnmpVersion function has the following syntax:

```
setSnmpVersion (version)
```

The value of *version* can be 1, 2, 2c, or 3.

The snmpCounter64 Function

The snmpCounter64 function has the following syntax:

```
snmpCounter64 (x)
```

The value of *x* must be a variable. This function interprets the value of *x* as an SNMPv2 64-bit counter. It is an optional function because it is dependent on the agent. If 64-bit SNMPv2 counters appear in a MIB, and they are properly tagged as such in the response SNMP packet, the poller reports on them correctly.

The useWrappedValue Function

The useWrappedValue function has the following syntax:

```
useWrappedValue (x)
```

The value of *x* must be a variable. This function compares the current value of *x* to its value at the previous poll. If *x* is lower than that value, the function evaluates it to the absolute value of *x*. If *x* is higher than that value, the function evaluates it to the difference of the current value minus the value at the previous poll.

The isAggregated Function

The isAggregated function has the following syntax:

```
VarN = isAggregated ()
```

The isAggregated function specifies that this MTF variable is an aggregation of data from another element (such as a child element). It is a marker that denotes which columns are defined and aggregated internally by the poller. Its presence or absence has **no** effect on the data being placed in the database. Instead, isAggregated marks columns in the MTF that would not otherwise be specified so reports that reference the column will know the column is valid. Within the MTF, you can **remove** the isAggregated statement from a variable, thus making that variable untrendable for the parent. You should never add isAggregated to a variable that is not already marked that way in another MTF of the same media type. The only option is to remove isAggregated, which should be done when a device does not support the aggregated column.

If you are defining a new parent element based on an existing element type, you can mimic the current aggregation schemes, specify another variable instead, or remove the aggregation scheme. You cannot add isAggregated to a variable that was never aggregated in the parent type that you are modeling.

The min function

The min function has the following syntax:

```
min (x, y)
```

The values of *x* and *y* may be any expressions. This function returns the minimum value of *x* and *y*.

The max function

The max function has the following syntax:

```
max (x, y)
```

The values of *x* and *y* may be any expressions. This function returns the maximum value of *x* and *y*.

The nullData Function

The nullData function has the following syntax:

```
variable = nullData()
```

This function interprets any variable as null that is missing from the MTF, but that the poller collects by default. For example, the poller cannot measure an import element if it does not have a definition in the import data file. The nullData function interprets the import element as null to ensure that the poller does not report on it.

Compiling MIBs

Network Health uses a precompiled MIB (PCM) file to determine the MIB variables for which you want to collect data during the poll. A PCM file contains the name and object identifier (OID) for the variables that are defined in all MTFs that reference the MIB. In addition, each PCM file contains additional variables required by Network Health to discover and poll the element.

For example, the PCM file for the mib2.mib is as follows:

```
hrDeviceErrors 1.3.6.1.2.1.25.3.2.1.6
hrDiskStorageCapacity 1.3.6.1.2.1.25.3.6.1.4
hrMemorySize 1.3.6.1.2.1.25.2.2
hrProcessorLoad 1.3.6.1.2.1.25.3.3.1.2
hrStorageAllocationFailures 1.3.6.1.2.1.25.2.3.1.7
hrStorageAllocationUnits 1.3.6.1.2.1.25.2.3.1.4
hrStorageSize 1.3.6.1.2.1.25.2.3.1.5
hrStorageUsed 1.3.6.1.2.1.25.2.3.1.6
hrSystemNumUsers 1.3.6.1.2.1.25.1.5
ifInDiscards 1.3.6.1.2.1.2.2.1.13
ifInErrors 1.3.6.1.2.1.2.2.1.14
ifInNUcastPkts 1.3.6.1.2.1.2.2.1.12
ifInOctets 1.3.6.1.2.1.2.2.1.10
ifInUcastPkts 1.3.6.1.2.1.2.2.1.11
ifInUnknownProtos 1.3.6.1.2.1.2.2.1.15
ifLastChange 1.3.6.1.2.1.2.2.1.9
ifOperStatus 1.3.6.1.2.1.2.2.1.8
ifOutDiscards 1.3.6.1.2.1.2.2.1.19
ifOutErrors 1.3.6.1.2.1.2.2.1.20
ifOutNUcastPkts 1.3.6.1.2.1.2.2.1.18
ifOutOctets 1.3.6.1.2.1.2.2.1.16
ifOutUcastPkts 1.3.6.1.2.1.2.2.1.17
ifSpeed 1.3.6.1.2.1.2.2.1.5
ipForwDatagrams 1.3.6.1.2.1.4.6
```

To compile your MIB, you can edit the existing PCM file for your MIB or use the nhCompileMib command.

Editing the PCM File

If you are creating an MTF for which a PCM file was supplied, you must edit the PCM file only. However, before you reinstall or upgrade Network Health, you should make a copy of this PCM file.

To edit an existing PCM file, you add the name and OID of your variable. The OID must include the indicator for the table in which the variable resides and the indicator for the instance of that variable. For example, the variable ifInOctets is the tenth instance in table 1:

```
ifInOctets 1.3.6.1.2.1.2.2.1.10
```

NOTE
The OID for your variable must use the SNMPv1 format.

Using the nhCompileMib Command

To use the nhCompileMib command:

1. Make sure that both your MTF and MIB files are in */nethealth/*poller.
2. Optionally, use one of these commands to source the Network Health resource file that is appropriate for your shell environment

Table 2-4: Commands Used to Source Network Health Resource Files

Shell	Command
Bourne	`. nethealthrc.sh`
C	`source nethealthrc.csh`
Korn	`. nethealthrc.ksh`

NOTE
If you do not source the resource file, change to the */nethealth/*bin directory or specify that directory in your Network Health commands.

3. Enter the following command:

```
nethealth/bin/nhCompileMib -a mibFile.mib > & mibFile.mib.pcm
```

NOTE
You must include the ampersand (&) with the redirect (>).

The resulting PCM file contains all OIDs from both your MIB file and the */nethealth/*poller/nhCommonMib file.

If you have difficulty compiling the MIB, you must edit it to remove or change offending lines. Some vendor's MIBs do not easily compile unless you edit the file. You should delete any tables or individual variables from the MIB that your MTF does not need.

Specifying Null Data

If the agent type for an MTF does not support a variable, the poller will still report on it by default, assigning it a value of zero. However, if you assign "null data" to an MTF variable, Network Health disregards it when polling. As a result, in the Trend report, Network Health does not present the variable as valid. Rather than assigning a value of 0 to the data, it considers the data to be nonexistent.

If you do not define variables 1 through 30 for a given MTF, Network Health considers them to be null data. If you omit them from the file, it considers them to be invalid for elements assigned to that MTF. However, it interprets the latencyMsec and availableTime variables differently. Network Health assumes that all polled elements support the values for these functions. Therefore, by default, it considers their data to be valid.

If a device does not support the latencyMsec or availableTime variable, you must assign null data to the appropriate variable in the MTF using the following syntax:

```
latencyMsec = nullData()
availableTime = nullData() + deltaTime/100
```

NOTE

Since Health reports do not support the null data feature, the MTF assigns a default value of zero to the nullData() function. Therefore, you must append the additional calculation to the availableTime variable to prevent Health reports from generating exceptions for an availability of zero.

Adding Agents to the List of Agent Types

After constructing the MTF, you must add the agent that you defined to the list of agent types in */nethealth/*poller/agent.types. Network Health uses this file to provide the agents for the Poller Configuration, Modify Element, and Add Element dialog boxes.

NOTE

If you reinstall or upgrade Network Health, follow this procedure to add your agents to the agent.types file.

To add an agent:

1. Change to the */nethealth/*poller directory.
2. Rename the agent.types file as agent.types.bak to retain the previous version.
3. If you are adding a response path MTF, delete or rename the dataSourceInfo.ddi file.
4. Quit the Network Health console. Select **Console → Quit**.
5. Restart the console using the nethealth command. Network Health automatically recreates the agent.types and the dataSourceInfo.ddi files.

Polling Your Elements

Before you can poll the elements for which you created an MTF, you must perform the following tasks:

- Restart the Network Health server.
- Assign the newly created agents to your elements.
- Add your elements to the poller configuration.

Restarting Network Health

After creating an MTF, you must restart your Network Health server by following these steps:

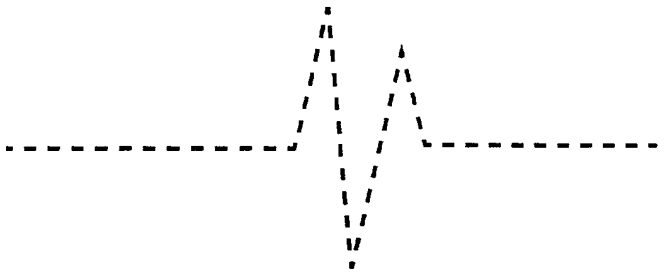
1. Stop the Network Health server. Select **Console → Stop Server**.
2. Restart the Network Health server. Select **Console → Start Server**.

Assigning Agents to Elements

For Network Health to collect and store data relating to the variables that you defined in your MTF, you must assign your new agent type to each element. Use the Poller Configuration dialog box to modify the agent type of existing elements. Refer to the *Network Health User Guide* for instructions on modifying elements. If you have created your own element type, Network Health cannot locate your elements during the discover process. However, it might locate those elements using a different agent type.

Adding Elements to the Poller Configuration

If your elements do not appear in the Poller Configuration dialog box, you must add your elements. Refer to the *Network Health User Guide* for instructions on adding elements. To create variable labels for use in Network Health Trend reports, refer to Chapter 3.



3

Adding Variable Labels

To make your variables available to Network Health reports, you need to add labels for these variables to the Network Health database. You can modify four files to add labels and then update the database using the nhConvertDb command. This chapter describes how to modify these four files.

Modifying User Files

To add labels to the database, Network Health provides the following four files, located in */nethealth/*db/data:

- elementType.usr
- columnExpression.usr
- variable.usr
- elementTypeVariable.usr

By default, each of these files does not contain any data. Network Health provides a .sys version of each file that contains the default labels used by Network Health.

NOTE

Do not modify the .sys files. To add your labels, you must modify the .usr files.

When modifying the .usr files to add variable labels, keep in mind the following rules:

- Always place a vertical bar (|) between fields.
- Do not place a vertical bar within the data or at the end of the row.
- Always enter a value in each field; fields cannot be blank.
- Do not use tabs; tabs are not supported.
- Always end the last entry with a single carriage return. Do not add any blank lines to the file.
- To add your variable labels to the database, you may not need to modify all of the files.

The remainder of this section describes the .usr files and explains when and how to modify them.

Modifying the elementType.usr File

You only need to add an entry in the elementType.usr file if you are creating a new element type (that is, if you specified a user value for the mediaType statement in your MTF).

For each new element, you must add an entry in the elementType.usr file. This file associates your element type with a standard Network Health element type.

NOTE

You do not need to add entries to the elementType.usr file if you are not creating a new element.

Table 3-1 lists the elementType.usr fields and their required values.

Table 3-1: The elementType.usr Fields

Field	Description
ELEMENT_TYPE	The value that you assigned the mediaType variable in your MTF.
RPT_ALIAS_PITEM_TYPE	The Network Health element type to associate with your element type. Specify one of the following values: 0 Ethernet LAN 1 Token Ring LAN 2 MIB2 LAN 100 WAN 101 Frame Relay 102 MDBS 105 ATM Port 106 ATM Path 107 ATM Channel 200 Router 201 Router with Cache 250 Router CPU 251 Router CPU with Cache 300 Server 301 Server with no Virtual Memory 302 Server with no Memory 303 BMC Windows NT Server 304 BMC UNIX Server 305 Empire Windows NT Server 306 Empire UNIX Server 330 Server CPU 350 User Partition 352 BMC Windows NT Partition 353 BMC UNIX Partition 370 Server Disk 371 BMC Server Disk 502 Server LAN 600 Server WAN 700 Modem 701 ISDN Interface 725 Remote Access Server 750 RAS CPU 775 Modem Pool

Table 3-1: The elementType.usr Fields (Continued)

Field	Description
RPT_ALIAS_PITEM_TYPE (continued)	800 Network Path 803 FirstSense 805 Empire Service Response 825 Application Client 900 Application Server 1000 Traffic Accountant Probe 3000 System Partition 3001 BMC NT System Partition 3002 BMC UNIX System Partition 3100 UNIX Process Set 3101 NT Process Set 3200 UNIX Process Set Excluded 3201 NT Process Set Excluded 3300 UNIX Process 3301 NT Process
ELEMENT_CLASS	Specify 1.
LABEL	A label for the element. You can specify up to 32 characters.
WEB_LABEL	A label for the element in the Web interface for the list of elements in the Run Trend Report page. You can specify up to 64 characters.

The elementType.usr file should contain fields with a format that is similar to those in the elementType.sys file, as shown in this example:

```
  0|   0|   1|Ethernet          |Ethernet
  1|   1|   1|Token Ring        |Token Ring
  2| 100|   1|MIB2LAN           |MIB2 Lan Port
100| 100|   1|WAN               |WAN
101| 101|   1|Frame Relay       |Frame Relay
105| 100|   1|ATM Port          |ATM Port
106| 101|   1|ATM Path          |ATM Path
200| 200|   1|Router            |Router/Switch
201| 201|   1|Router            |Router with 1 CPU
```

Network Health uses the elementType files to determine the element type to use for your element when generating reports and displaying in list form, such as lists for groups. In the above file, MIB2 LAN has an ELEMENT_TYPE of 2 and RPT_ALIAS_PITEM_TYPE of 100, which is a WAN element type. Network Health uses a WAN element type for all MIB2 LAN elements.

To add an entry for your element:

1. In the first field, specify the value (without a minus (-) sign) that you assigned to mediaType in your MTF.
2. In the second field, associate your element type with a standard Network Health element type.
3. In the third field, specify 1.
4. In the fourth and fifth fields, create appropriate labels for your element. If you are creating your own element type, provide a unique Web label so that Network Health can display your element in lists (such as Trend reports) on the Web.

Modifying the variable.usr File

To create a unique label for variables in your MTF, you must add an entry in the variable.usr file. This label appears in the list of variables for running a Trend report on your element type. You can use existing Network Health labels that are defined in the variable.sys file for your variables.

Table 3-2 lists the variable.usr fields and their required values.

NOTE

You do not need to add entries to the variable.usr file if you are using existing variable labels.

Table 3-2: The variable.usr Fields

Field	Description
VAR_ID	A unique number to identify the variable. Specify the following ranges: Original Equipment Manufacturer (OEM): 900,000 up to 1,000,000 End-user: 1,000,000 and above

Table 3-2: The variable.usr Fields (Continued)

Field	Description
UNITS_ID	A number indicating the type of units used to measure this variable. Specify the following values: 0 Rate as a counter 1 Bytes as a counter 2 Frames as a counter 3 Errors as a counter 4 Percent as a gauge 5 Per second as a gauge 6 Buffers as a gauge 7 Bytes as a gauge 8 Cells as a counter 9 Pages as a gauge 10 Total time as a gauge 11 Milliseconds as a gauge 12 Per call minute as a gauge 13 Gauge as a gauge 14 Bits per call second as a counter 15 Bits as a counter 16 Minimum milliseconds as a gauge 17 Maximum milliseconds as a gauge 18 Transactions as a counter 19 Size as an aggregate value that can be either an average (for gauge percentage values) or a total (for counter values)
LABEL	A label used to identify the variable in a list. You can specify up to 32 characters. Spaces are permitted.
SHORT_LABEL	A shorter label for the variable. You can specify up to 16 characters. Spaces are permitted.
SYMBOL	An internal identifier for the variable. It must be unique for the element type. You can specify up to 32 characters. Spaces are not permitted.

The variable.usr file should contain fields that are similar in format to the variable.sys file, as shown in the following example:

```
1|   2|Frames                |Frames          |frames
2|   1|Bytes                 |Bytes           |bytes
3|   2|Broadcasts            |Broadcasts      |broadcasts
4|   2|Multicasts            |Multicasts      |multicasts
5|   2|Alignment Errors      |Alignment Errors|alignmentErrors
6|   2|Collisions            |Collisions      |collisions
7|   2|Errors                |Errors          |errors
8|   2|TR Abort Errors       |TR Abort Errors |abortErrors
9|   2|TR Burst Errors       |TR Burst Errors |burstErrors
```

Add an entry in the variable.usr file only for those variables for which you want to create your labels.

To add an entry:

1. In the first field, assign each variable a VAR_ID using the ranges listed in Table 3-2.
2. In the second field, indicate the type of units for measuring the data.
3. In the third field, create a label that is unique for your element type. You can specify up to 32 characters. This label appears in the list of available variables in the Run Trend Report dialog box when your element is selected.
4. In the fourth field, specify the same label, but truncate it to 16 characters.
5. In the fifth field, specify the same label, but omit spaces and begin with a lowercase letter. The label you enter in this field must also be unique for your element type.

Modifying the columnExpression.usr File

The columnExpression files identify a column or a formula for the data that you are storing in the database. Add entries in the columnExpression.usr file only if you want to use a formula such as a variable derivative for your data. You do not need to add entries to this file if you are only storing data in one of the columns that is available for your use. For example, if you want to store the total number of bytes, you could create a column expression that uses the following formula:

```
BYTES_IN+BYTES_OUT
```

NOTE

The above formula is an existing column expression with a column ID (COL_ID) of 85 in the columnExpression.sys file.

Table 3-3 lists the columnExpression.usr fields and their required values.

Table 3-3: The columnExpression.usr Fields

Field	Description
COL_ID	A number to identify the column. If you are creating your own column expressions, specify these ranges: OEM: 900,000 up to 1,000,000 End-user: 1,000,000 and above
COL_EXPRESSION	A string of up to 255 characters that describe the column or the formula for the data.

The columnExpression.usr file should contain fields that are similar in format to the columnExpression.sys file, as shown in the following example.

```
30|BYTES_OUT
31|DLL_TRANSITS+DLL_ENET_FRAMES
32|DLL_ERRORS-DLL_COLLISIONS
33|(TR_LOST_FRAME-DLL_FRAMES)-TR_BURST-TR_CONGESTION-TR_CONT
ENTION_STREAMI
34|(FLOAT4(TR_CONTENTION_STREAMING)/FLOAT4(TR_BIT_STREAMING)
)*DELTA_TIME*1
43|UTIL
```

NOTE

You can include combinations of variables in the COL_EXPRESSION string, similar to Columns 31 through 34 in this example.

The COL_ID associates a variable with a column expression in the database. If you are just using one of the 30 columns and do not need a formula, you do not need to create an entry in the columnExpression.usr file. Refer to Table A-1 on page A-2 for a list of the column IDs for variable1 through variable30 and the associated column expression.

If you want to add an entry to the columnExpression.usr file, select an identifier using the range listed in Table 3-3. You can use the columnExpression.sys file as a template for creating your column expression.

Modifying the elementTypeVariable.usr File

The elementTypeVariable.usr file associates your variable with an element type, a variable ID, and a column. You **must** create an entry in the elementTypeVariable.usr file for each variable that you created in your MTF. Table 3-4 lists the elementTypeVariable.usr fields and their required values.

Table 3-4: The elementTypeVariable.usr Fields

Field	Description
ELEMENT_TYPE	The element identifier from either the elementType.sys or the elementType.usr file.
VAR_ID	The variable identifier from either the variable.sys or the variable.usr file for the variable.
DATA_SRC	Specify 1.
COL_ID	The column identifier from either the columnExpression.sys or the columnExpression.usr file for the variable.

The elementTypeVariable.usr file should contain fields that are similar in format to the elementTypeVariable.sys file, as shown in the following example:

```
0|      1|      1|      1
0|      2|      1|      2
0|      3|      1|      4
0|      4|      1|      3
0|      5|      1|     11
0|      6|      1|      9
0|      7|      1|     10
0|    118|      1|     57
0|    119|      1|     58
0|    120|      1|     59
0|    121|      1|     60
```

To add entries:

1. For the first field, select an existing element type from the elementType.sys file. If you are creating elements, you must specify the ELEMENT_TYPE value that you added to the elementType.usr file.

2. For the second field, specify the variable ID from the variable.sys file. If you created your own variable label, specify the VAR_ID that you created in the variable.usr file.
3. For the third field, specify 1.
4. For the fourth field, specify a column ID from the columnExpression.sys file if you are using an existing column expression. For example, if you assigned your MIB variable to variable26, specify 26 for the COL_ID. If you create a column expression for a formula, specify the COL_ID that you added to the columnExpression.usr file.

Updating the Database

To update the Network Health database with your changes to the label tables, you use the nhConvertDb command. The command has the following syntax:

```
nhConvertDb database
```

The database variable specifies the name of the database to convert. This is required.

To run the nhConvertDb command:

1. Stop the Network Health server. Select **Console → Stop Server**.
2. If you used the default database name, nethealth, enter the following command:

   ```
   /nethealth/bin/nhConvertDb nethealth
   ```
3. When the database conversion finishes, restart the Network Health server. Select **Console → Start Server**.

A

Database Column Assignments

Each type of element has a set of database columns that are fixed and reserved for Network Health, a set of database columns reserved for use by original equipment manufacturers (OEM) or third parties, and a set of database columns reserved for users. OEMs and users can add their own variables (such as error- free seconds) to the second and third sets of columns.

For the following element types, the tables in this appendix list the database columns (by MTF variable name) and the purpose of each. Variables not reserved by Network Health are available to OEMs or users.

- Ethernet
- Token Ring
- WAN
- MIB2 LAN and MIB2 LAN Full Duplex
- Frame Relay
- ATM Ports
- ATM Paths
- ATM Channels
- Routers
- Router CPUs
- Servers
- Server CPUs
- Server Partitions
- Server Disks
- Server Interfaces
- Server Process Sets
- Remote access server (RAS) devices

- Modem pools
- Modems
- ISDN interfaces
- Network paths
- Network paths for DNS
- Network paths for HTTP
- Network paths for voice over IP
- Network Paths for FirstSense
- Network Paths for Empire Service Response

In addition, Table A-1 lists the column IDs and the associated column expressions for variable1 through variable30 as defined in the columnExpression.sys file.

Table A-1: Column IDs and Column Expression

COL_ID	COLUMN_EXPRESSION
1	DLL_FRAMES
2	DLL_BYTES
3	DLL_MCASTS
4	DLL_BCASTS
5	DLL_RCV_OFF_FRAMES
6	DLL_XMT_OFF_FRAMES
7	DLL_TRANSITS
8	DLL_ENET_FRAMES
9	DLL_COLLISIONS
10	DLL_ERRORS
11	DLL_ALGN_ERRORS
12	TR_SET_RECOVERY_MODE
13	TR_SIGNAL_LOSS
14	TR_BIT_STREAMING
15	TR_CONTENTION_STREAMING
16	TR_LINE

Table A-1: Column IDs and Column Expression (Continued)

COL_ID	COLUMN_EXPRESSION
17	TR_BURST
18	TR_INTERNAL
19	TR_ABORT
20	TR_ADDRESS_COPIED
21	TR_CONGESTION
22	TR_LOST_FRAME
23	TR_TOKEN
24	TR_FREQUENCY
25	TR_FRAME_COPIED
26	TR_LLC_FRAMES
27	PACKETS_IN
28	BYTES_IN
29	PACKETS_OUT
30	BYTES_OUT

Table A-2: Column Allocations for Ethernet Elements

MTF Variable	Description
variable1	Number of frames
variable2	Number of bytes
variable3	Number of multicasts
variable4	Number of broadcasts
variable5	Available for OEM use
variable6	Available for OEM use
variable7	Available for OEM use
variable8	Available for OEM use
variable9	Number of collisions
variable10	Number of errors

Table A-2: Column Allocations for Ethernet Elements (Continued)

MTF Variable	Description
variable11	Number of alignment errors
variable12	Number of non-unicast frames (in)
variable13	Number of deferred frames (out)
variable14	Number of discards total (in+out)
variable15	Reserved
variable16	Number of unknown protocol packets
variable17	Reserved
variable18	Reserved
variable19	Reserved
variable20	Reserved
variable21	Reserved
variable22	Number of frames (in)
variable23	Number of bytes (in)
variable24	Number of errors (in)
variable25	Number of discards (in)
variable26	Available for use
variable27	Available for use
variable28	Available for use
variable29	Available for use
variable30	Available for use

Table A-3: Column Allocations for Token Ring Elements

MTF Variable	Description
variable1	Number of frames
variable2	Number of bytes
variable3	Number of multicasts
variable4	Number of broadcasts

Table A-3: Column Allocations for Token Ring Elements (Continued)

MTF Variable	Description
variable5	Available for OEM use
variable6	Available for OEM use
variable7	Available for OEM use
variable8	Available for OEM use
variable9	Available for OEM use
variable10	Number of errors
variable11	Available for use
variable12	Number of Token Ring Beaconing Event 1
variable13	Number of Token Ring Beaconing Event 2
variable14	Number of Token Ring Beaconing Event 3
variable15	Number of Token Ring Beaconing Event 4
variable16	Number of Token Ring soft error type 1
variable17	Number of Token Ring soft error type 2
variable18	Number of Token Ring soft error type 3
variable19	Number of Token Ring soft error type 4
variable20	Number of Token Ring soft error type 5
variable21	Number of Token Ring soft error type 6
variable22	Number of Token Ring soft error type 7
variable23	Number of Token Ring soft error type 8
variable24	Number of Token Ring soft error type 9
variable25	Number of Token Ring soft error type 10
variable26	Number of Token Ring logical link frames
variable27	Number of frames inbound on an interface
variable28	Number of bytes inbound on an interface
variable29	Number of frames outbound on an interface
variable30	Number of bytes outbound on an interface

Table A-4: Column Allocations for WAN Elements

MTF Variable	Description
variable1	Number of frames (in)
variable2	Number of bytes (in)
variable3	Number of non-unicast frames (in)
variable4	Number of non-unicast frames (in+out)
variable5	Available for OEM use
variable6	Available for OEM use
variable7	Number of queue drops (in)
variable8	Number of queue drops (out)
variable9	Number of discarded frames (in)
variable10	Number of all errors (minus discards) (in)
variable11	Reserved
variable12	Reserved
variable13	Reserved
variable14	Reserved
variable15	Reserved
variable16	Number of unknown protocols (in)
variable17	Available for OEM use
variable18	Reserved
variable19	Reserved
variable20	Reserved
variable21	Reserved
variable22	Number of frames (in+out)
variable23	Number of bytes (in+out)
variable24	Number of all errors (minus discards) (in +out)
variable25	Number of discarded frames (in+out)
variable26	Available for OEM use

Table A-4: Column Allocations for WAN Elements (Continued)

MTF Variable	Description
variable27	Available for OEM use
variable28	Available for use
variable29	Available for use
variable30	Available for use

Table A-5: Column Allocations for MIB2 LAN and MIB2 LAN Full Duplex Elements

MTF Variable	Description
variable1	Number of frames (in)
variable2	Number of bytes (in)
variable3	Number of non-unicast frames (in)
variable4	Number of non-unicast frames (in+out)
variable5	Number of collisions (out)
variable6	Number of deferred frames (out)
variable7	Number of queue drops (in)
variable8	Number of queue drops (out)
variable9	Number of discarded frames (in)
variable10	Number of all errors (minus discards) (in)
variable11	Reserved
variable12	Reserved
variable13	Reserved
variable14	Reserved
variable15	Reserved
variable16	Number of unknown protocols (in)
variable17	Number of alignment errors
variable18	Reserved
variable19	Reserved

Table A-5: Column Allocations for MIB2 LAN and MIB2 LAN Full Duplex Elements (Continued)

MTF Variable	Description
variable20	Reserved
variable21	Reserved
variable22	Number of frames (in+out)
variable23	Number of bytes (in+out)
variable24	Number of all errors (minus discards) (in+out)
variable25	Number of discarded frames (in+out)
variable26	Available for OEM use
variable27	Available for OEM use
variable28	Available for use
variable29	Available for use
variable30	Available for use

Table A-6: Column Allocations for Frame Relay Elements

MTF Variable	Description
variable1	Reserved
variable2	Reserved
variable3	Reserved
variable4	Available for OEM use
variable5	Available for OEM use
variable6	Available for OEM use
variable7	Available for OEM use
variable8	Available for OEM use
variable9	Available for use
variable10	Number of all errors
variable11	Available for use
variable12	Number of BECNs (in)

Table A-6: Column Allocations for Frame Relay Elements (Continued)

MTF Variable	Description
variable13	Number of BECNs (out)
variable14	Number of FECNs (in)
variable15	Number of FECNs (out)
variable16	Number of discards
variable17	Number of discard eligible drops
variable18	Number of non-discard eligible drops
variable19	Number of drops
variable20	Number of discard eligible frames (in)
variable21	Number of discard eligible frames (out)
variable22	Number of discard eligible bytes (in)
variable23	Number of discard eligible bytes (out)
variable24	Available for use
variable25	Available for use
variable26	Available for use
variable27	Number of frames (in)
variable28	Number of bytes (in)
variable29	Number of frames (out)
variable30	Number of bytes (out)

Table A-7: Column Allocations for ATM Ports

MTF Variable	Description
variable1	Number of cells (in)
variable2	Number of bytes (in)
variable3	Reserved
variable4	Available for OEM use
variable5	Available for OEM use
variable6	Errored seconds

Table A-7: Column Allocations for ATM Ports (Continued)

MTF Variable	Description
variable7	Severely errored seconds
variable8	Unavailable seconds
variable9	Number of discards (in)
variable10	Number of errors (minus discards) (in)
variable11	Number of AAL5 PDUs received
variable12	Number of AAL5 PDUs transmitted
variable13	Number of AAL5 Received PDUs dropped
variable14	Number of AAL5 Transmitted PDUs dropped
variable15	CLP1 discards total
variable16	CLP1 discards in
variable17	CLP1 cells total
variable18	CLP1 cells in
variable19	Reserved
variable20	Reserved
variable21	Reserved
variable22	Number of cells (in+out)
variable23	Number of bytes (in+out)
variable24	Number of errors (in+out)
variable25	Number of discards (in+out)
variable26	Policy violations total
variable27	Policy violations in
variable28	Available for use
variable29	Available for use
variable30	Available for use

Table A-8: Column Allocations for ATM Paths

MTF Variable	Description
variable1	Number of AAL5 received PDUs dropped
variable2	Number of AAL5 transmitted PDUs dropped
variable3	Number of AAL5 PDUs received
variable4	Available for OEM use
variable5	Available for OEM use
variable6	Available for OEM use
variable7	Available for OEM use
variable8	Available for OEM use
variable9	Number of AAL5 PDUs transmitted
variable10	Reserved
variable11	Reserved
variable12	Number of discards (in)
variable13	Number of discards (out)
variable14	Number of CLP1 discards total
variable15	Number of CLP1 discards in
variable16	Number of maximum channels (in)
variable17	Number of allocated channels (in)
variable18	Number of CLP1 cells total
variable19	Number of CLP1 cells in
variable20	Number of maximum channels (out)
variable21	Number of allocated channels (out)
variable22	Available for use
variable23	Available for use
variable24	Number of policy violations total
variable25	Number of policy violations in
variable26	Available for use

Table A-8: Column Allocations for ATM Paths (Continued)

MTF Variable	Description
variable27	Number of cells (in)
variable28	Number of bytes (in)
variable29	Number of cells (out)
variable30	Number of bytes (out)

Table A-9: Column Allocations for ATM Channels

MTF Variable	Description
variable1	Number of AAL5 received PDUs dropped
variable2	Number of AAL5 transmitted PDUs dropped
variable3	Number of AAL5 PDUs received
variable4	Available for OEM use
variable5	Available for OEM use
variable6	Available for OEM use
variable7	Available for OEM use
variable8	Available for OEM use
variable9	Number of AAL5 PDUs transmitted
variable10	Reserved
variable11	Reserved
variable12	Number of discards (in)
variable13	Number of discards (out)
variable14	Reserved
variable15	Number of CLP1 discards total
variable16	Number of CLP1 discards total (in)
variable17	Number of CLP1 cells total
variable18	Number of CLP1 cells in
variable19	Reserved
variable20	Reserved

Table A-9: Column Allocations for ATM Channels (Continued)

MTF Variable	Description
variable21	Number of policy violations (total)
variable22	Number of policy violations (in)
variable23	Available for use
variable24	Available for use
variable25	Available for use
variable26	Available for use
variable27	Number of cells (in)
variable28	Number of bytes (in)
variable29	Number of cells (out)
variable30	Number of bytes (out)

Table A-10: Column Allocations for Routers

MTF Variable	Description
variable1	Number of frames (in)
variable2	Number of bytes (in)
variable3	Number of non-unicast frames (in)
variable4	Average line utilization
variable5	Average discard rate
variable6	Average packet fault rate
variable7	Number of input queue drops (total)
variable8	Number of output queue drops (total)
variable9	Number of discards (in)
variable10	Number of all errors (minus discards) (in)
variable11	Number of slow packets (in)
variable12	Number of slow packets (out)
variable13	Number of fast packets (in)
variable14	Number of fast packets (out)

Table A-10: Column Allocations for Routers (Continued)

MTF Variable	Description
variable15	Number of bridged packets
variable16	Number of unknown packets
variable17	Number of IP packets
variable18	Number of DECnet packets
variable19	Number of XNS packets
variable20	Number of Appletalk packets
variable21	Number of forward IPX packets
variable22	Number of frames (total)
variable23	Number of bytes (total)
variable24	Number of errors (minus discards) (total)
variable25	Number of frames discarded (total)
variable26	Number of non-unicast frames (total)
variable27	Reserved
variable28	Reserved
variable29	Reserved
variable30	Reserved

Table A-11: Column Allocations for Router CPUs

MTF Variable	Description
variable1	Reserved
variable2	Reserved
variable3	Reserved
variable4	Available for OEM use
variable5	Available for OEM use
variable6	Available for OEM use
variable7	Available for OEM use
variable8	Available for OEM use

Table A-11: Column Allocations for Router CPUs (Continued)

MTF Variable	Description
variable9	Reserved
variable10	Available for use
variable11	Number of bus drops
variable12	CPU count
variable13	Free memory
variable14	Total number of buffers
variable15	Number of buffers used
variable16	Number of small buffer hits
variable17	Number of small buffer misses
variable18	Number of medium buffer hits
variable19	Number of medium buffer misses
variable20	Number of big buffer hits
variable21	Number of big buffer misses
variable22	Number of large buffer hits
variable23	Number of large buffer misses
variable24	Number of huge buffer hits
variable25	Number of huge buffer misses
variable26	Available for use
variable27	Available for use
variable28	Available for use
variable29	Available for use
variable30	Number of buffer create failures

Table A-12: Column Allocations for Servers

MTF Variable	Description
variable1	Number of page ins
variable2	CPU load average
variable3	Number of page outs
variable4	Number of page swap ins
variable5	Number of page swap outs
variable6	Number of file cache hits
variable7	Number of file cache misses
variable8	Total physical memory
variable9	Physical memory used
variable10	Number of page faults
variable11	Average CPU utilization
variable12	CPU imbalance
variable13	Number of interrupts
variable14	Number of active connections
variable15	Number of dropped connections
variable16	Total virtual memory
variable17	Virtual memory used
variable18	Number of small communication buffers dropped
variable19	Total number of large communication buffers
variable20	Number of large communication buffers used
variable21	Number of page scans
variable22	Number of system calls
variable23	Number of processes
variable24	Sum of errors (in+out) and discards
variable25	Sum of discards (in+out)
variable26	Total CPU utilization

Table A-12: Column Allocations for Servers (Continued)

MTF Variable	Description
variable27	Sum of packets (in)
variable28	Sum of octets (in)
variable29	Sum of packets (out)
variable30	Sum of octets (out)

Table A-13: Column Allocations for Server CPUs

MTF Variable	Description
variable1	Available for OEM use
variable2	Available for OEM use
variable3	Available for OEM use
variable4	Available for OEM use
variable5	Available for use
variable6	Available for use
variable7	Available for use
variable8	Available for use
variable9	Reserved
variable10	Reserved
variable11	Reserved
variable12	Reserved
variable13	Reserved
variable14	Reserved
variable15	Reserved
variable16	Reserved
variable17	Reserved
variable18	Reserved
variable19	Reserved
variable20	Reserved

Table A-13: Column Allocations for Server CPUs (Continued)

MTF Variable	Description
variable21	Reserved
variable22	Reserved
variable23	Reserved
variable24	CPU utilization
variable25	CPU user time
variable26	CPU system time
variable27	CPU wait time
variable28	CPU idle time
variable29	Reserved
variable30	Reserved

Table A-14: Column Allocations for User and System Server Partitions

MTF Variable	Description
variable1	Inode utilization
variable2	Total bytes transmitted and received during the interval, preferably payload bytes
variable3	Available for OEM use
variable4	Available for OEM use
variable5	Available for use
variable6	Available for use
variable7	Available for use
variable8	Available for use
variable9	Reserved
variable10	Reserved
variable11	Reserved
variable12	Reserved
variable13	Reserved

Table A-14: Column Allocations for User and System Server Partitions

MTF Variable	Description
variable14	Reserved
variable15	Reserved
variable16	Reserved
variable17	Reserved
variable18	Reserved
variable19	Reserved
variable20	Reserved
variable21	Reserved
variable22	Reserved
variable23	Reserved
variable24	Storage capacity
variable25	Storage used
variable26	Reserved
variable27	Partition allocation failures
variable28	Reads
variable29	Writes
variable30	Reads plus writes

Table A-15: Column Allocations for Server Disks

MTF Variable	Description
variable1	Available for OEM use
variable2	Available for OEM use
variable3	Time spent in the busy state
variable4	Queue length
variable5	Available for use
variable6	Available for use
variable7	Reserved

Table A-15: Column Allocations for Server Disks (Continued)

MTF Variable	Description
variable8	Reserved
variable9	Reserved
variable10	Reserved
variable11	Reserved
variable12	Reserved
variable13	Reserved
variable14	Reserved
variable15	Reserved
variable16	Reserved
variable17	Reserved
variable18	Reserved
variable19	Reserved
variable20	Reserved
variable21	Reserved
variable22	Reserved
variable23	Reserved
variable24	Storage capacity
variable25	Storage used
variable26	Reserved
variable27	Faults
variable28	Reads
variable29	Writes
variable30	Reads plus writes

Table A-16: Column Allocations for Server Interfaces

MTF Variable	Description
variable1	Number of frames (in)
variable2	Number of bytes (in)
variable3	Number of non-unicast frames (in)
variable4	Number of non-unicast frames (in+out)
variable5	Reserved
variable6	Reserved
variable7	Reserved
variable8	Reserved
variable9	Number of errors (in)
variable10	Number of discards (in)
variable11	Reserved
variable12	Reserved
variable13	Reserved
variable14	Reserved
variable15	Reserved
variable16	Number of unknown protocols (in)
variable17	Reserved
variable18	Outgoing queue length
variable19	Reserved
variable20	Reserved
variable21	Reserved
variable22	Number of frames (total)
variable23	Number of bytes (total)
variable24	Number of errors (total)
variable25	Number of discards total
variable26	Reserved

Table A-16: Column Allocations for Server Interfaces (Continued)

MTF Variable	Description
variable27	Reserved
variable28	Reserved
variable29	Reserved
variable30	Reserved

Table A-17: Column Allocations for Server Process Sets

MTF Variable	Description
variable1	Reserved
variable2	Average CPU utilization
variable3	Physical memory used
variable4	Virtual memory used
variable5	Number of pages paged
variable6	Number of pages swapped
variable7	Number of disk blocks read
variable8	Number of disk blocks written
variable9	Number of incoming network messages
variable10	Number of outgoing network messages
variable11	Number of system calls
variable12	Number of threads
variable13	Number of hard page faults
variable14	Number of soft page faults
variable15	Number of swaps
variable16	Reserved
variable17	Reserved
variable18	Reserved
variable19	Reserved
variable20	Reserved

Table A-17: Column Allocations for Server Process Sets (Continued)

MTF Variable	Description
variable21	Reserved
variable22	Reserved
variable23	Reserved
variable24	Reserved
variable25	Reserved
variable26	Reserved
variable27	Reserved
variable28	Reserved
variable29	Reserved
variable30	Reserved

Table A-18: Column Allocations for RAS Devices

MTF Variable	Description
variable1	Reserved
variable2	Connection time in call seconds
variable3	Number of connect errors
variable4	Average CPU utilization
variable5	CPU imbalance
variable6	Number of non-connect (other) errors
variable7	Number of octets transmitted
variable8	Number of octets received
variable9	Number of discards
variable10	Number of frame errors
variable11	Total memory
variable12	Memory used
variable13	Number of retrains
variable14	Number of frames transmitted
variable15	Number of frames received

Table A-18: Column Allocations for RAS Devices (Continued)

MTF Variable	Description
variable16	Number of connections
variable17	Time spent in the onhook state
variable18	Time spent in the offhook state
variable19	Time spent in the connected state
variable20	Time spent in the disabled state
variable21	Time spent in the unknown state
variable22	Time since the last successful poll
variable23	Modems in use/occupied
variable24	Number of modems/ISDN in the RAS
variable25	Time spent in the busy state
variable26	Time spent in the test state
variable27	Available for use
variable28	Available for use
variable29	Available for use
variable30	Available for use

Table A-19: Column Allocations for Modem Pools

MTF Variable	Description
variable1	Reserved
variable2	Connection time in call seconds
variable3	Number of connect errors
variable4	Reserved
variable5	Reserved
variable6	Number of non-connect (other) errors
variable7	Number of octets transmitted
variable8	Number of octets received
variable9	Number of discards

Table A-19: Column Allocations for Modem Pools (Continued)

MTF Variable	Description
variable10	Number of frame errors
variable11	Reserved
variable12	Reserved
variable13	Number of retrains
variable14	Number of frames transmitted
variable15	Number of frames received
variable16	Number of connections
variable17	Time spent in the onhook state
variable18	Time spent in the offhook state
variable19	Time spent in the connected state
variable20	Time spent in the disabled state
variable21	Time spent in the unknown state
variable22	Time since the last successful poll
variable23	Modems in use/occupied
variable24	Number of modems/ISDN in the pool
variable25	Time spent in the busy state
variable26	Time spent in the test state
variable27	Available for use
variable28	Available for use
variable29	Available for use
variable30	Available for use

Table A-20: Column Allocations for Modems

MTF Variable	Description
variable1	Reserved
variable2	Connection time in call seconds
variable3	Number of connect errors

Table A-20: Column Allocations for Modems (Continued)

MTF Variable	Description
variable4	Reserved
variable5	Reserved
variable6	Number of non-connect (other) errors
variable7	Number of octets transmitted
variable8	Number of octets received
variable9	Number of discards
variable10	Number of frame errors
variable11	Call transmit rate
variable12	Call receive rate
variable13	Number of retrains
variable14	Number of frames transmitted
variable15	Number of frames received
variable16	Number of connections
variable17	Time spent in the onhook state
variable18	Time spent in the offhook state
variable19	Time spent in the connected state
variable20	Time spent in the disabled state
variable21	Time spent in the unknown state
variable22	Available for use
variable23	Occupied flag
variable24	Available for use
variable25	Time spent in the busy state
variable26	Time spent in the test state
variable27	Available for use
variable28	Available for use
variable29	Available for use
variable30	Available for use

Table A-21: Column Allocations for ISDN Interfaces

MTF Variable	Description
variable1	Reserved
variable2	Connection time in call seconds
variable3	Reserved
variable4	Reserved
variable5	Reserved
variable6	Reserved
variable7	Number of octets transmitted
variable8	Number of octets received
variable9	Number of discards
variable10	Number of frame errors
variable11	Call transmit rate
variable12	Call receive rate
variable13	Reserved
variable14	Number of frames transmitted
variable15	Number of frames received
variable16	Number of connections
variable17	Time spent in the onhook state
variable18	Time spent in the offhook state
variable19	Time spent in the connected state
variable20	Time spent in the disabled state
variable21	Time spent in the unknown state
variable22	Reserved
variable23	Connected flag
variable24	Reserved
variable25	Time spent in the busy state
variable26	Time spent in the test state
variable27	Available for use

Table A-21: Column Allocations for ISDN Interfaces (Continued)

MTF Variable	Description
variable28	Available for use
variable29	Available for use
variable30	Available for use

Table A-22: Column Allocations for Network Paths

MTF Variable	Description
variable1	The minimum response time in milliseconds found over the path during the interval
variable2	The maximum response time in milliseconds found over the path during the interval
variable3	The sum of the squares of total response times
variable4	The number of attempts to detect the round-trip time during the interval
variable5	The number of successful attempts to detect the round-trip time during the interval
variable6	Total bytes transmitted and received during the interval, preferably payload bytes
variable7	Total bytes received during the interval, preferably payload bytes
variable8	Reserved
variable9	Reserved
variable10	Reserved
variable11	Reserved
variable12	Reserved
variable13	Reserved
variable14	Reserved
variable15	Reserved
variable16	Reserved
variable17	Reserved
variable18	Reserved

Table A-22: Column Allocations for Network Paths (Continued)

MTF Variable	Description
variable19	Reserved
variable20	Available for use
variable21	Available for use
variable22	Available for use
variable23	Available for use
variable24	Available for use
variable25	Available for use
variable26	Available for use
variable27	Available for use
variable28	Available for use
variable29	Available for use
variable30	Available for use

Table A-23: Column Allocations for Network Paths Using DNS

MTF Variable	Description
variable1	The minimum response time in milliseconds found over the path during the interval
variable2	The maximum response time in milliseconds found over the path during the interval
variable3	Reserved
variable4	The number of attempts to detect the round-trip time during the interval
variable5	The number of successful attempts to detect the round-trip time during the interval
variable6	Total bytes transmitted and received during the interval, preferably payload bytes
variable7	Total bytes received during the interval, preferably payload bytes
variable8	Available for use

Table A-23: Column Allocations for Network Paths Using DNS (Continued)

MTF Variable	Description
variable9	Reserved
variable10	Reserved
variable11	Reserved
variable12	Reserved
variable13	Reserved
variable14	Reserved
variable15	Reserved
variable16	Reserved
variable17	Reserved
variable18	Reserved
variable19	Reserved
variable20	Available for use
variable21	Available for use
variable22	Available for use
variable23	Available for use
variable24	Available for use
variable25	Available for use
variable26	Available for use
variable27	Available for use
variable28	Available for use
variable29	Available for use
variable30	Available for use

Table A-24: Column Allocations for Network Paths Using HTTP

MTF Variable	Description
variable1	The minimum response time in milliseconds found over the path during the interval
variable2	The maximum response time in milliseconds found over the path during the interval
variable3	Reserved
variable4	The number of attempts to detect the round-trip time during the interval
variable5	The number of successful attempts to detect the round-trip time during the interval
variable6	Total bytes transmitted and received during the interval, preferably payload bytes
variable7	Total bytes received during the interval, preferably payload bytes
variable8	The sum of the response time in milliseconds for the DNS transactions. Used to calculate the average associated DNS response time.
variable9	Reserved
variable10	Reserved
variable11	Reserved
variable12	Reserved
variable13	Reserved
variable14	Reserved
variable15	Reserved
variable16	Reserved
variable17	Reserved
variable18	Reserved
variable19	Available for use
variable20	Available for use
variable21	Available for use

Table A-24: Column Allocations for Network Paths Using HTTP (Continued)

MTF Variable	Description
variable22	Available for use
variable23	Available for use
variable24	Available for use
variable25	Available for use
variable26	Available for use
variable27	Available for use
variable28	Available for use
variable29	Available for use
variable30	Available for use

Table A-25: Column Allocations for Network Paths for Voice over IP (Jitter)

MTF Variable	Description
variable1	The minimum response time in milliseconds found over the path during the interval
variable2	The maximum response time in milliseconds found over the path during the interval
variable3	Reserved
variable4	The number of attempts to detect the round-trip time during the interval
variable5	The number of successful attempts to detect the round-trip time during the interval
variable6	Total bytes transmitted and received during the interval, preferably payload bytes
variable7	Total bytes received during the interval, preferably payload bytes
variable8	The sum of all jitter measurements from source to destination
variable9	The sum of all negative jitter measurements from source to destination

Table A-25: Column Allocations for Network Paths for Voice over IP (Jitter) (Continued)

MTF Variable	Description
variable10	The sum of all jitter measurements from destination to source
variable11	The sum of all negative jitter measurements from destination to source
variable12	The maximum positive jitter measurement from source to destination during the interval
variable13	The maximum negative jitter measurement (absolute value) from source to destination during the interval
variable14	The maximum positive jitter measurement from destination to source
variable15	The maximum negative jitter measurement (absolute value) from destination to source
variable16	Reserved
variable17	Reserved
variable18	Reserved
variable19	Reserved
variable20	The total number of jitter measurements from source to destination
variable21	The total number of positive jitter measurements from source to destination
variable22	The total number of negative jitter measurements from source to destination
variable23	The total number of jitter measurements from destination to source
variable24	The total number of positive jitter measurements from destination to source
variable25	The total number of negative jitter measurements from destination to source
variable 26	Available for use
variable 27	Available for use

Table A-25: Column Allocations for Network Paths for Voice over IP (Jitter) (Continued)

MTF Variable	Description
variable 28	Available for use
variable 29	Available for use
variable 30	Available for use

Table A-26: Column Allocations for Application Paths for FirstSense

MTF Variable	Description
variable1	Reserved
variable2	Reserved
variable3	The sum of the squares of total response times
variable4	The number of attempts to detect the round-trip time during the interval
variable5	The number of successful attempts to detect the round-trip time during the interval
variable6	Total bytes transmitted and received during the interval, preferably payload bytes
variable7	Total bytes received during the interval, preferably payload bytes
variable8	The sum of connect response times in milliseconds
variable9	The number of connect attempts
variable10	The number of connect sucesses
variable11	Reserved
variable12	Reserved
variable13	Reserved
variable14	Reserved
variable15	Reserved
variable16	Reserved
variable17	Reserved

Table A-26: Column Allocations for Application Paths for FirstSense (Continued)

MTF Variable	Description
variable18	The total client time
variable19	The total server time
variable20	Available for use
variable21	Available for use
variable22	Available for use
variable23	Available for use
variable24	Available for use
variable25	Available for use
variable26	Available for use
variable27	Available for use
variable28	Available for use
variable29	Available for use
variable30	Available for use

Table A-27: Column Allocations for Network Paths for Empire Service Response

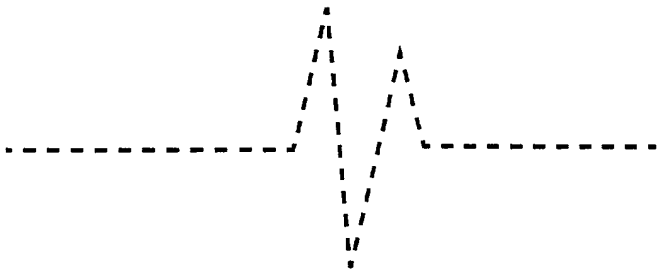
MTF Variable	Description
variable1	The minimum total response time in milliseconds found over the path during the interval
variable2	The maximum total response time in milliseconds found over the path during the interval
variable3	Reserved
variable4	The number of attempts to detect the round-trip time during the interval
variable5	The number of successful attempts to detect the round-trip time during the interval
variable6	Reserved for total bytes transmitted and received during the interval, preferably payload bytes

Table A-27: Column Allocations for Network Paths for Empire Service Response (Continued)

MTF Variable	Description
variable7	Reserved for total bytes received during the interval, preferably payload bytes
variable8	The sum of connect response times in milliseconds
variable9	Reserved
variable10	Reserved
variable11	The minimum connect response time in milliseconds
variable12	The maximum connect response time in milliseconds
variable13	The sum of name lookup response times in milliseconds
variable14	The minimum name lookup response time in milliseconds
variable15	The maximum name lookup response time in milliseconds
variable16	Reserved
variable17	Reserved
variable18	Reserved
variable19	Reserved
variable20	The sum of the response times in milliseconds for the Empire Service Response transactions
variable21	The minimum transaction response time in milliseconds
variable22	The maximum transaction response time in milliseconds
variable23	Available for use
variable24	Available for use
variable25	Available for use
variable26	Available for use
variable27	Available for use

Table A-27: Column Allocations for Network Paths for Empire Service Response (Continued)

MTF Variable	Description
variable28	Available for use
variable29	Available for use
variable30	Available for use



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APPENDIX B

TITLE: LIVEEXCEPTION SYSTEM

APPLICANT: MARK W. SYLOR, GEORGE IGLESIAS, JAY B. WOLF, WILL C. LAUER AND LAWRENCE A. STABILE

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Ethernet	0	alignmentErrors	Alignment Errors	Alignment Errors	5	2	Frames	0	/sec	DLL_ALGN_ERRORS	11
Ethernet	0	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Ethernet	0	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
Ethernet	0	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Ethernet	0	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speed))	92
Ethernet	0	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speed))	87
Ethernet	0	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((DLL_BYTES-TR_TOKEN)*8*100.0)/$(speed))	269
Ethernet	0	bits	Bits	Bits	437	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
Ethernet	0	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
Ethernet	0	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((DLL_BYTES-TR_TOKEN)*8.0)	268
Ethernet	0	broadcasts	Broadcasts	Broadcasts	3	2	Frames	0	/sec	DLL_BCASTS	4
Ethernet	0	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	DLL_BYTES	2
Ethernet	0	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	TR_TOKEN	23
Ethernet	0	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	DLL_BYTES-TR_TOKEN	265
Ethernet	0	collisions	Collisions	Collisions	6	2	Frames	0	/sec	DLL_COLLISIONS	9
Ethernet	0	collisionsPct	Collisions %	Collisions %	602	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
Ethernet	0	defFramesOut	Deferred Frames (out)	Def Frames Out	626	2	Frames	0	/sec	TR_SIGNAL_LOSS	13
Ethernet	0	discardFrames	Discards	Discards	69	2	Frames	0	/sec	TR_BIT_STREAMING	14
Ethernet	0	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	TR_FRAME_COPIED	25
Ethernet	0	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/DLL_FRAMES	270
Ethernet	0	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	TR_BIT_STREAMING-TR_FRAME_COPIED	263
Ethernet	0	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*(TR_BIT_STREAMING-TR_FRAME_COPIED)/DLL_FRAMES	272
Ethernet	0	discardsPct	Discards %	Discards %	604	4	Percent	1	%	100.0*DELTA_TIME*TR_BIT_STREAMING/DLL_FRAMES	274
Ethernet	0	errors	Errors	Errors	7	2	Frames	0	/sec	DLL_ERRORS	10
Ethernet	0	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*TR_FREQUENCY/DLL_FRAMES	271
Ethernet	0	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(DLL_ERRORS-TR_FREQUENCY)/DLL_FRAMES	273
Ethernet	0	errorsPct	Errors %	Errors %	603	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
Ethernet	0	faultsIn	Errors In	Errors In	194	0	Rate	0	/sec	TR_FREQUENCY	24
Ethernet	0	faultsOut	Errors Out	Errors Out	195	0	Rate	0	/sec	DLL_ERRORS-TR_FREQUENCY	266
Ethernet	0	frames	Frames	Frames	1	2	Frames	0	/sec	DLL_FRAMES	1
Ethernet	0	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	TR_LOST_FRAME	22
Ethernet	0	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	DLL_FRAMES-TR_LOST_FRAME	264
Ethernet	0	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Ethernet	0	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Ethernet	0	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Ethernet	0	multicasts	Multicasts	Multicasts	4	2	Frames	0	/sec	DLL_MCASTS	3
Ethernet	0	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	TR_SET_RECOVERY_MODE	12
Ethernet	0	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	DLL_MCASTS+DLL_BCASTS-TR_SET_RECOVERY_MODE	267
Ethernet	0	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Ethernet	0	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Ethernet	0	unicast	Unicast	Unicast	711	2	Frames	0	/sec	DLL_FRAMES-DLL_BCASTS-DLL_MCASTS	314
Ethernet	0	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Token Ring	1	abortErrors	TR Abort Errors	TR Abort Errors	8	2	Frames	0	/sec	TR_ABORT	19
Token Ring	1	addressCopiedErrors	TR Address Copied Errors	TR AddrCopy Errs	434	2	Frames	0	/sec	TR_ADDRESS_COPIED	20
Token Ring	1	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Token Ring	1	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
Token Ring	1	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Token Ring	1	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speed))	92
Token Ring	1	bits	Bits	Bits	437	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
Token Ring	1	broadcasts	Broadcasts	Broadcasts	3	2	Frames	0	/sec	DLL_BCASTS	4

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Token Ring	1	burstErrors	TR Burst Errors	TR Burst Errors	9	2	Frames	0	/sec	TR_BURST	17
Token Ring	1	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	DLL_BYTES	2
Token Ring	1	congestionErrors	TR Congestion Errors	TR Cong Errors	10	2	Frames	0	/sec	TR_CONGESTION	21
Token Ring	1	errors	Errors	Errors	7	2	Frames	0	/sec	DLL_ERRORS	10
Token Ring	1	frameCopiedErrors	TR Frame Copied Errors	TR Frame Copied	11	2	Frames	0	/sec	TR_FRAME_COPIED	25
Token Ring	1	frames	Frames	Frames	1	2	Frames	0	/sec	DLL_FRAMES	1
Token Ring	1	frequencyErrors	TR Frequency Errors	TR Freq Errors	12	2	Frames	0	/sec	TR_FREQUENCY	24
Token Ring	1	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Token Ring	1	hardErrors	TR Hard Errors	TR Hard Errors	61	2	Frames	0	/sec	TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS+TR_BIT_STREAMING+TR_CONTENTION_STREAMING	51
Token Ring	1	internalErrors	TR Internal Errors	TR Internal Errs	13	2	Frames	0	/sec	TR_INTERNAL	18
Token Ring	1	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Token Ring	1	lineErrors	TR Line Errors	TR Line Errors	14	2	Frames	0	/sec	TR_LINE	16
Token Ring	1	llcFrames	TR LLC Frames	TR LLC Frames	15	2	Frames	0	/sec	TR_LLC_FRAMES	26
Token Ring	1	lostFrameErrors	TR Lost Frame Errors	TR Lost Frm Err	16	2	Frames	0	/sec	TR_LOST_FRAME	22
Token Ring	1	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Token Ring	1	multicasts	Multicasts	Multicasts	4	2	Frames	0	/sec	DLL_MCASTS	3
Token Ring	1	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1 0))	76
Token Ring	1	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Token Ring	1	softErrors	TR Soft Errors	TR Soft Errors	62	2	Frames	0	/sec	TR_LINE+TR_BURST+TR_INTERNAL+TR_ABORT+TR_ADDRESS_COPIED+TR_CONGESTION+TR_LOST_FRAME+TR_TOKEN+TR_FREQUENCY+TR_FRAME_COPIED	52
Token Ring	1	tokenErrors	TR Token Errors	TR Token Errors	17	2	Frames	0	/sec	TR_TOKEN	23
Token Ring	1	unicast	Unicast	Unicast	711	2	Frames	0	/sec	DLL_FRAMES-DLL_BCASTS-DLL_MCASTS	314
MIB2LAN	2	alignmentErrors	Alignment Errors	Alignment Errors	5	2	Frames	0	/sec	TR_BURST	17
MIB2LAN	2	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
MIB2LAN	2	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
MIB2LAN	2	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
MIB2LAN	2	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
MIB2LAN	2	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
MIB2LAN	2	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speed))	87
MIB2LAN	2	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speed))	92
MIB2LAN	2	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
MIB2LAN	2	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
MIB2LAN	2	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
MIB2LAN	2	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
MIB2LAN	2	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
MIB2LAN	2	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_BYTES	2
MIB2LAN	2	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
MIB2LAN	2	collisionsOut	Collisions (out)	Collisions Out	627	2	Frames	0	/sec	DLL_RCV_OFF_FRAMES	5
MIB2LAN	2	collisionsOutPct	Collisions (out) %	Collisions Out %	720	4	Percent	1	%	100.0*DELTA_TIME*DLL_RCV_OFF_FRAMES/(TR_LOST_FRAME-DLL_FRAMES)	327
MIB2LAN	2	defFramesOut	Deferred Frames (out)	Def Frames Out	626	2	Frames	0	/sec	DLL_XMT_OFF_FRAMES	6
MIB2LAN	2	discardedFrames	Discarded Frames	Discarded Frames	57	2	Frames	0	/sec	TR_FRAME_COPIED	25
MIB2LAN	2	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
MIB2LAN	2	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
MIB2LAN	2	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
MIB2LAN	2	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
MIB2LAN	2	errors	Errors	Errors	7	2	Frames	0	/sec	TR_FREQUENCY	24
MIB2LAN	2	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
MIB2LAN	2	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
MIB2LAN	2	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	64

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
MIB2LAN	2	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
MIB2LAN	2	errorsPct	Errors %	Errors %	603	4	Percent	1	%	100.0*DELTA_TIME*TR_FREQUENCY/TR_LOST_FRAME	219
MIB2LAN	2	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
MIB2LAN	2	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	DLL_FRAMES	1
MIB2LAN	2	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
MIB2LAN	2	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
MIB2LAN	2	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
MIB2LAN	2	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
MIB2LAN	2	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	DLL_BCASTS	4
MIB2LAN	2	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
MIB2LAN	2	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(DLL_BCASTS-DLL_MCASTS)	84
MIB2LAN	2	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
MIB2LAN	2	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
MIB2LAN	2	unicast	Unicast	Unicast	711	2	Frames	0	/sec	TR_LOST_FRAME-DLL_BCASTS	316
MIB2LAN	2	unicastIn	Unicast In	Unicast In	712	2	Frames	0	/sec	DLL_FRAMES-DLL_MCASTS	315
MIB2LAN	2	unicastOut	Unicast Out	Unicast Out	713	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)-(DLL_BCASTS-DLL_MCASTS)	300
MIB2LAN	2	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Switch Lite Backplane	3	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Switch Lite Backplane	3	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
Switch Lite Backplane	3	backplaneUtilization	Backplane Utilization	Backplane Util	540	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speedTotal))	79
Switch Lite Backplane	3	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Switch Lite Backplane	3	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
Switch Lite Backplane	3	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Switch Lite Backplane	3	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Switch Lite Backplane	3	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Switch Lite Backplane	3	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Switch Lite Backplane	3	totalBytes	Total Bytes	Ttl Bytes	124	1	Bytes	0	/sec	TR_TOKEN	23
MIB2LAN	4	alignmentErrors	Alignment Errors	Alignment Errors	5	2	Frames	0	/sec	TR_BURST	17
MIB2LAN	4	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
MIB2LAN	4	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
MIB2LAN	4	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
MIB2LAN	4	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
MIB2LAN	4	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
MIB2LAN	4	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speedTotal))	79
MIB2LAN	4	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speedIn))	78
MIB2LAN	4	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
MIB2LAN	4	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
MIB2LAN	4	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_BYTES*8 0)	160
MIB2LAN	4	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
MIB2LAN	4	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
MIB2LAN	4	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_BYTES	2
MIB2LAN	4	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
MIB2LAN	4	collisionsOut	Collisions (out)	Collisions Out	627	2	Frames	0	/sec	DLL_RCV_OFF_FRAMES	5
MIB2LAN	4	collisionsOutPct	Collisions (out) %	Collisions Out %	720	4	Percent	1	%	100.0*DELTA_TIME*DLL_RCV_OFF_FRAMES/(TR_LOST_FRAME-DLL_FRAMES)	327
MIB2LAN	4	defFramesOut	Deferred Frames (out)	Def Frames Out	626	2	Frames	0	/sec	DLL_XMT_OFF_FRAMES	6
MIB2LAN	4	discardedFrames	Discarded Frames	Discarded Frames	57	2	Frames	0	/sec	TR_FRAME_COPIED	25

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
MIB2LAN	4	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
MIB2LAN	4	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
MIB2LAN	4	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
MIB2LAN	4	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
MIB2LAN	4	errors	Errors	Errors	7	2	Frames	0	/sec	TR_FREQUENCY	24
MIB2LAN	4	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
MIB2LAN	4	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
MIB2LAN	4	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	64
MIB2LAN	4	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
MIB2LAN	4	errorsPct	Errors %	Errors %	603	4	Percent	1	%	100.0*DELTA_TIME*TR_FREQUENCY/TR_LOST_FRAME	219
MIB2LAN	4	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
MIB2LAN	4	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	DLL_FRAMES	1
MIB2LAN	4	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
MIB2LAN	4	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
MIB2LAN	4	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
MIB2LAN	4	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
MIB2LAN	4	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	DLL_BCASTS	4
MIB2LAN	4	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
MIB2LAN	4	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(DLL_BCASTS-DLL_MCASTS)	84
MIB2LAN	4	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
MIB2LAN	4	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
MIB2LAN	4	unicast	Unicast	Unicast	711	2	Frames	0	/sec	TR_LOST_FRAME-DLL_BCASTS	316
MIB2LAN	4	unicastIn	Unicast In	Unicast In	712	2	Frames	0	/sec	DLL_FRAMES-DLL_MCASTS	315
MIB2LAN	4	unicastOut	Unicast Out	Unicast Out	713	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)-(DLL_BCASTS-DLL_MCASTS)	300
MIB2LAN	4	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
WAN	100	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
WAN	100	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
WAN	100	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
WAN	100	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
WAN	100	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
WAN	100	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speedTotal))	79
WAN	100	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speedIn))	78
WAN	100	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
WAN	100	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
WAN	100	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
WAN	100	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
WAN	100	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
WAN	100	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_BYTES	2
WAN	100	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
WAN	100	discardedFrames	Discarded Frames	Discarded Frames	57	2	Frames	0	/sec	TR_FRAME_COPIED	25
WAN	100	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
WAN	100	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
WAN	100	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
WAN	100	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
WAN	100	errors	Errors	Errors	7	2	Frames	0	/sec	TR_FREQUENCY	24
WAN	100	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
WAN	100	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
WAN	100	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	64

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
WAN	100	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
WAN	100	errorsPct	Errors %	Errors %	603	4	Percent	1	%	100.0*DELTA_TIME*TR_FREQUENCY/TR_LOST_FRAME	219
WAN	100	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
WAN	100	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	DLL_FRAMES	1
WAN	100	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
WAN	100	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
WAN	100	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
WAN	100	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
WAN	100	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	DLL_BCASTS	4
WAN	100	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
WAN	100	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(DLL_BCASTS-DLL_MCASTS)	84
WAN	100	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
WAN	100	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
WAN	100	unicast	Unicast	Unicast	711	2	Frames	0	/sec	TR_LOST_FRAME-DLL_BCASTS	316
WAN	100	unicastIn	Unicast In	Unicast In	712	2	Frames	0	/sec	DLL_FRAMES-DLL_MCASTS	315
WAN	100	unicastOut	Unicast Out	Unicast Out	713	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)-(DLL_BCASTS-DLL_MCASTS)	300
WAN	100	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Frame Relay	101	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Frame Relay	101	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*(BYTES_IN+BYTES_OUT)/(PACKETS_IN+PACKETS_OUT)	305
Frame Relay	101	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
Frame Relay	101	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
Frame Relay	101	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Frame Relay	101	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	(((BYTES_IN+BYTES_OUT)*8*100.0)/$(speedTotal))	91
Frame Relay	101	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((BYTES_IN*8*100.0)/$(speedIn))	90
Frame Relay	101	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	((BYTES_OUT*8*100.0)/$(speedOut))	89
Frame Relay	101	becnIn	BECN In	BECN In	30	2	Frames	0	/sec	TR_SET_RECOVERY_MODE	12
Frame Relay	101	becnInPct	BECN In %	BECN In %	630	4	Percent	1	%	100.0*DELTA_TIME*TR_SET_RECOVERY_MODE/PACKETS_IN	277
Frame Relay	101	becnOut	BECN Out	BECN Out	31	2	Frames	0	/sec	TR_SIGNAL_LOSS	13
Frame Relay	101	becnOutPct	BECN Out %	BECN Out %	631	4	Percent	1	%	100.0*DELTA_TIME*TR_SIGNAL_LOSS/PACKETS_OUT	278
Frame Relay	101	bits	Bits	Bits	437	15	Bits	0	/sec	((BYTES_IN+BYTES_OUT)*8.0)	162
Frame Relay	101	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(BYTES_IN*8.0)	164
Frame Relay	101	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(BYTES_OUT*8.0)	167
Frame Relay	101	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Frame Relay	101	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	BYTES_IN	28
Frame Relay	101	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	BYTES_OUT	30
Frame Relay	101	congestionInPct	FECN + BECN In %	FECN/BECN In %	533	4	Percent	1	%	100 0*DELTA_TIME*(TR_SET_RECOVERY_MODE+TR_BIT_STREAMING)/PACKETS_IN	195
Frame Relay	101	congestionOutPct	FECN + BECN Out %	FECN/BECN Out %	534	4	Percent	1	%	100 0*DELTA_TIME*(TR_SIGNAL_LOSS+TR_CONTENTION_STREAMING)/PACKETS_OUT	196
Frame Relay	101	deBytesIn	DE Bytes In	DE Bytes In	40	2	Frames	0	/sec	TR_LOST_FRAME	22
Frame Relay	101	deBytesOut	DE Bytes Out	DE Bytes Out	41	2	Frames	0	/sec	TR_TOKEN	23
Frame Relay	101	deDrops	DE Drops	DE Drops	35	2	Frames	0	/sec	TR_BURST	17
Frame Relay	101	deFramesIn	DE Frames In	DE Frames In	38	2	Frames	0	/sec	TR_ADDRESS_COPIED	20
Frame Relay	101	deFramesInPct	DE Frames In %	DE Frames In %	721	4	Percent	1	%	100.0*DELTA_TIME*TR_ADDRESS_COPIED/PACKETS_IN	328
Frame Relay	101	deFramesOut	DE Frames Out	DE Frames Out	39	2	Frames	0	/sec	TR_CONGESTION	21
Frame Relay	101	deFramesOutPct	DE Frames Out %	DE Frames Out %	722	4	Percent	1	%	100.0*DELTA_TIME*TR_CONGESTION/PACKETS_OUT	329
Frame Relay	101	discards	Discards	Discards	221	2	Frames	0	/sec	TR_LINE	16
Frame Relay	101	discardsPct	Discards %	Discards %	604	4	Percent	1	%	100.0*DELTA_TIME*TR_LINE/(PACKETS_IN+PACKETS_OUT)	221

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Frame Relay	101	drops	Drops	Drops	37	2	Frames	0	/sec	TR_ABORT	19
Frame Relay	101	errors	Errors	Errors	7	2	Frames	0	/sec	DLL_ERRORS	10
Frame Relay	101	errorsPct	Errors %	Errors %	603	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/(PACKETS_IN+PACKETS_OUT)	220
Frame Relay	101	fecnIn	FECN In	FECN In	32	2	Frames	0	/sec	TR_BIT_STREAMING	14
Frame Relay	101	fecnInPct	FECN In %	FECN In %	628	4	Percent	1	%	100.0*DELTA_TIME*TR_BIT_STREAMING/PACKETS_IN	275
Frame Relay	101	fecnOut	FECN Out	FECN Out	33	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Frame Relay	101	fecnOutPct	FECN Out %	FECN Out %	629	4	Percent	1	%	100.0*DELTA_TIME*TR_CONTENTION_STREAMING/PACKETS_OUT	276
Frame Relay	101	frames	Frames	Frames	1	2	Frames	0	/sec	(PACKETS_IN+PACKETS_OUT)	75
Frame Relay	101	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	PACKETS_IN	27
Frame Relay	101	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	PACKETS_OUT	29
Frame Relay	101	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Frame Relay	101	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Frame Relay	101	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Frame Relay	101	nonDeDrops	Non-DE Drops	Non-DE Drops	36	2	Frames	0	/sec	TR_INTERNAL	18
Frame Relay	101	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1 0))	76
Frame Relay	101	reboots	Reboots	Reboots	121	4	Percent	1	%	(100 0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
MDBS	102	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
MDBS	102	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
MDBS	102	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
MDBS	102	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
MDBS	102	blocksCorrectedErros	Blocks Corrected Errors	Blks Corctd Err	295	2	Frames	0	/sec	PACKETS_IN	27
MDBS	102	blocksTransmitted	Blocks Transmitted	Rvs Blks Tran	297	2	Frames	0	/sec	PACKETS_OUT	29
MDBS	102	blocksUncorrectable	Blocks Uncorrectable	Blks UnCorrect	294	2	Frames	0	/sec	TR_LLC_FRAMES	26
MDBS	102	blocksWrongColorCode	Blocks Wrong Color Code	Blks Wrng CCode	296	2	Frames	0	/sec	BYTES_IN	28
MDBS	102	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
MDBS	102	bytesRecieved	Bytes Received	Bytes Received	22	1	Bytes	0	/sec	DLL_FRAMES	1
MDBS	102	bytesTransmitted	Bytes Transmitted	Bytes Tx	23	1	Bytes	0	/sec	DLL_BYTES	2
MDBS	102	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
MDBS	102	errors	Errors	Errors	7	2	Frames	0	/sec	DLL_ERRORS	10
MDBS	102	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
MDBS	102	noRFChannelsTime	No RF Channels Time	No RF Chanl Time	292	10	Total Time	1	(%)	TR_INTERNAL	18
MDBS	102	octetsTransmitted	Octets Transmitted	Rvs Oct Rcvd	298	1	Bytes	0	/sec	BYTES_OUT	30
MDBS	102	openRFChannelsTime	Open RF Channels Time	Open RF Chan Tim	293	10	Total Time	1	(%)	TR_BURST	17
MDBS	102	successfulPlannedHops	Successful Planned Hops	Suc Plan Hop	291	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
MDBS	102	successfulUnplannedHops	Successful Unplanned Hops	Suc Unpln Hop	290	0	Rate	0	/sec	DLL_RCV_OFF_FRAMES	5
MDBS	102	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Visual Frame Relay	103	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Visual Frame Relay	103	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*(BYTES_IN+BYTES_OUT)/(PACKETS_IN+PACKETS_OUT)	305
Visual Frame Relay	103	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*BYTES_IN/PACKETS_IN	307
Visual Frame Relay	103	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*BYTES_OUT/PACKETS_OUT	308
Visual Frame Relay	103	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Visual Frame Relay	103	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	(((BYTES_IN+BYTES_OUT)*8*100.0)/$(speedTotal))	91
Visual Frame Relay	103	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((BYTES_IN*8*100.0)/$(speedIn))	90
Visual Frame Relay	103	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	((BYTES_OUT*8*100.0)/$(speedOut))	89
Visual Frame Relay	103	becnIn	BECN In	BECN In	30	2	Frames	0	/sec	TR_SET_RECOVERY_MODE	12
Visual Frame Relay	103	becnOut	BECN Out	BECN Out	31	2	Frames	0	/sec	TR_SIGNAL_LOSS	13
Visual Frame Relay	103	bits	Bits	Bits	437	15	Bits	0	/sec	((BYTES_IN+BYTES_OUT)*8.0)	162
Visual Frame Relay	103	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(BYTES_IN*8.0)	164
Visual Frame Relay	103	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(BYTES_OUT*8.0)	167
Visual Frame Relay	103	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Visual Frame Relay	103	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	BYTES_IN	28
Visual Frame Relay	103	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	BYTES_OUT	30
Visual Frame Relay	103	congestionInPct	FECN + BECN In %	FECN/BECN In %	533	4	Percent	1	%	100.0*DELTA_TIME*(TR_SET_RECOVERY_MODE+TR_BIT_STREAMING)/PACKETS_IN	195
Visual Frame Relay	103	congestionOutPct	FECN + BECN Out %	FECN/BECN Out %	534	4	Percent	1	%	100.0*DELTA_TIME*(TR_SIGNAL_LOSS+TR_CONTENTION_STREAMING)/PACKETS_OUT	196
Visual Frame Relay	103	deBytesIn	DE Bytes In	DE Bytes In	40	2	Frames	0	/sec	TR_LOST_FRAME	22
Visual Frame Relay	103	deBytesOut	DE Bytes Out	DE Bytes Out	41	2	Frames	0	/sec	TR_TOKEN	23
Visual Frame Relay	103	deFramesIn	DE Frames In	DE Frames In	38	2	Frames	0	/sec	TR_ADDRESS_COPIED	20
Visual Frame Relay	103	deFramesOut	DE Frames Out	DE Frames Out	39	2	Frames	0	/sec	TR_CONGESTION	21
Visual Frame Relay	103	errors	Errors	Errors	7	2	Frames	0	/sec	DLL_ERRORS	10
Visual Frame Relay	103	fecnIn	FECN In	FECN In	32	2	Frames	0	/sec	TR_BIT_STREAMING	14
Visual Frame Relay	103	fecnOut	FECN Out	FECN Out	33	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Visual Frame Relay	103	frameDeliveryRatio	Frame Delivery Ratio	Frame Del Ratio	559	4	Percent	1	%	(100.0*DLL_BCASTS)	209
Visual Frame Relay	103	frames	Frames	Frames	1	2	Frames	0	/sec	(PACKETS_IN+PACKETS_OUT)	75
Visual Frame Relay	103	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	PACKETS_IN	27
Visual Frame Relay	103	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	PACKETS_OUT	29
Visual Frame Relay	103	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Visual Frame Relay	103	latency	Round Trip Delay	Round Trip Delay	560	4	Percent	1	%	LATENCY	81
Visual Frame Relay	103	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Visual Frame Relay	103	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Visual Frame Relay	103	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Visual Frame Relay	103	visualBurst1	Burst Advisor Level 1	Burst Advisor 1	554	4	Percent	1	%	(100.0*DLL_RCV_OFF_FRAMES)	204
Visual Frame Relay	103	visualBurst2	Burst Advisor Level 2	Burst Advisor 2	555	4	Percent	1	%	(100.0*DLL_XMT_OFF_FRAMES)	205
Visual Frame Relay	103	visualBurst3	Burst Advisor Level 3	Burst Advisor 3	556	4	Percent	1	%	(100.0*DLL_TRANSITS)	206
Visual Frame Relay	103	visualBurst4	Burst Advisor Level 4	Burst Advisor 4	557	4	Percent	1	%	(100.0*DLL_ENET_FRAMES)	207
Visual Frame Relay	103	visualBurst5	Burst Advisor Level 5	Burst Advisor 5	558	4	Percent	1	%	(100.0*DLL_COLLISIONS)	208
ATM Port	105	aal5Pdus	AAL5 PDUs	AAL5 PDUs	432	8	Cells	0	/sec	DLL_ALGN_ERRORS+TR_SET_RECOVERY_MODE	156
ATM Port	105	aal5PdusDiscarded	Discarded AAL5 PDUs	AAL5PDUs Dsc	433	8	Cells	0	/sec	TR_SIGNAL_LOSS+TR_BIT_STREAMING	157
ATM Port	105	aal5PdusDiscardedIn	Discarded AAL5 PDUs In	AAL5PDUs Dsc In	311	8	Cells	0	/sec	TR_SIGNAL_LOSS	13
ATM Port	105	aal5PdusDiscardedInPct	Discarded AAL5 PDUs In %	AAL5PDU Dsc In %	615	4	Percent	1	%	100.0*DELTA_TIME*TR_SIGNAL_LOSS/DLL_ALGN_ERRORS	226
ATM Port	105	aal5PdusDiscardedOut	Discarded AAL5 PDUs Out	AAL5PDUs Dsc Out	312	8	Cells	0	/sec	TR_BIT_STREAMING	14
ATM Port	105	aal5PdusDiscardedOutPct	Discarded AAL5 PDUs Out %	AAL5PDU Dsc Out%	616	4	Percent	1	%	100.0*DELTA_TIME*TR_BIT_STREAMING/TR_SET_RECOVERY_MODE	227
ATM Port	105	aal5PdusDiscardedPct	Discarded AAL5 PDUs %	AAL5PDU Dsc %	614	4	Percent	1	%	100.0*DELTA_TIME*(TR_SIGNAL_LOSS+TR_BIT_STREAMING)/(DLL_ALGN_ERRORS+TR_SET_RECOVERY_MODE)	225
ATM Port	105	aal5PdusIn	AAL5 PDUs In	AAL5 PDUs In	309	8	Cells	0	/sec	DLL_ALGN_ERRORS	11
ATM Port	105	aal5PdusOut	AAL5 PDUs Out	AAL5 PDUs Out	310	8	Cells	0	/sec	TR_SET_RECOVERY_MODE	12
ATM Port	105	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
ATM Port	105	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
ATM Port	105	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speedTotal))	79
ATM Port	105	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speedIn))	78
ATM Port	105	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
ATM Port	105	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
ATM Port	105	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
ATM Port	105	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
ATM Port	105	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
ATM Port	105	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_BYTES	2
ATM Port	105	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
ATM Port	105	cells	Cells	Cells	184	0	Rate	0	/sec	TR_LOST_FRAME	22
ATM Port	105	cellsIn	Cells In	Cells In	200	0	Rate	0	/sec	DLL_FRAMES	1
ATM Port	105	cellsOut	Cells Out	Cells Out	204	0	Rate	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
ATM Port	105	clp0Cells	CLP0 Cells	CLP0 Cells	423	8	Cells	0	/sec	TR_LOST_FRAME-TR_BURST	134

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
ATM Port	105	clp0CellsIn	CLP0 Cells In	CLP0 Cells In	424	8	Cells	0	/sec	DLL_FRAMES-TR_INTERNAL	135
ATM Port	105	clp0CellsOut	CLP0 Cells Out	CLP0 Cells Out	425	8	Cells	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)-(TR_BURST-TR_INTERNAL)	136
ATM Port	105	clp0Discards	CLP0 Discards	CLP0 Discards	420	8	Cells	0	/sec	TR_FRAME_COPIED-TR_CONTENTION_STREAMING	131
ATM Port	105	clp0DiscardsIn	CLP0 Discards In	CLP0 Discards In	421	8	Cells	0	/sec	DLL_COLLISIONS-TR_LINE	132
ATM Port	105	clp0DiscardsInPct	CLP0 Discards In %	CLP0 Dscds In %	621	4	Percent	1	%	100.0*DELTA_TIME*(DLL_COLLISIONS-TR_LINE)/(DLL_FRAMES-TR_INTERNAL)	232
ATM Port	105	clp0DiscardsOut	CLP0 Discards Out	CLP0 Discards Ou	422	8	Cells	0	/sec	(TR_FRAME_COPIED-TR_CONTENTION_STREAMING)-(DLL_COLLISIONS-TR_LINE)	133
ATM Port	105	clp0DiscardsOutPct	CLP0 Discards Out %	CLP0 Dscds Out %	622	4	Percent	1	%	100.0*DELTA_TIME*((TR_FRAME_COPIED-TR_CONTENTION_STREAMING)-(DLL_COLLISIONS-TR_LINE))/((TR_LOST_FRAME-TR_BURST)-(DLL_FRAMES-TR_INTERNAL))	233
ATM Port	105	clp0DiscardsPct	CLP0 Discards %	CLP0 Dscds %	620	4	Percent	1	%	100.0*DELTA_TIME*(TR_FRAME_COPIED-TR_CONTENTION_STREAMING)/(TR_LOST_FRAME-TR_BURST)	231
ATM Port	105	clp1Cells	CLP1 Cells	CLP1 Cells	411	8	Cells	0	/sec	TR_BURST	17
ATM Port	105	clp1CellsIn	CLP1 Cells In	CLP1 Cells In	412	8	Cells	0	/sec	TR_INTERNAL	18
ATM Port	105	clp1CellsInPct	CLP1 Cells In %	CLP1 Cells In %	717	4	Percent	1	%	100.0*TR_INTERNAL/DLL_FRAMES	319
ATM Port	105	clp1CellsOut	CLP1 Cells Out	CLP1 Cells Out	413	8	Cells	0	/sec	TR_BURST-TR_INTERNAL	128
ATM Port	105	clp1CellsOutPct	CLP1 Cells Out %	CLP1 Cells Out %	718	4	Percent	1	%	100 0*(TR_BURST-TR_INTERNAL)/(TR_LOST_FRAME-DLL_FRAMES)	320
ATM Port	105	clp1CellsPct	CLP1 Cells %	CLP1 Cells %	716	4	Percent	1	%	100 0*TR_BURST/TR_LOST_FRAME	318
ATM Port	105	clp1Discards	CLP1 Discards	CLP1 Disc	409	8	Cells	0	/sec	TR_CONTENTION_STREAMING	15
ATM Port	105	clp1DiscardsIn	CLP1 Discards In	CLP1 Disc In	408	8	Cells	0	/sec	TR_LINE	16
ATM Port	105	clp1DiscardsInPct	CLP1 Discards In %	CLP1 Dscds In %	618	4	Percent	1	%	100.0*DELTA_TIME*TR_LINE/TR_INTERNAL	229
ATM Port	105	clp1DiscardsOut	CLP1 Discards Out	CLP1 Disc Out	410	8	Cells	0	/sec	TR_CONTENTION_STREAMING-TR_LINE	127
ATM Port	105	clp1DiscardsOutPct	CLP1 Discards Out %	CLP1 Dscds Out %	619	4	Percent	1	%	100.0*DELTA_TIME*(TR_CONTENTION_STREAMING-TR_LINE)/(TR_BURST-TR_INTERNAL)	230
ATM Port	105	clp1DiscardsPct	CLP1 Discards %	CLP1 Dscds %	617	4	Percent	1	%	100 0*DELTA_TIME*TR_CONTENTION_STREAMING/TR_BURST	228
ATM Port	105	discards	Discards	Discards	495	8	Cells	0	/sec	TR_FRAME_COPIED	25
ATM Port	105	discardsIn	Discards In	Discards In	491	8	Cells	0	/sec	DLL_COLLISIONS	9
ATM Port	105	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
ATM Port	105	discardsOut	Discards Out	Discards Out	492	8	Cells	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
ATM Port	105	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
ATM Port	105	discardsPct	Discards %	Discards %	604	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_LOST_FRAME	262
ATM Port	105	erroredSeconds	Errored Seconds	Errored Seconds	299	4	Percent	1	%	DLL_XMT_OFF_FRAMES*100.0	153
ATM Port	105	errors	Errors	Errors	496	8	Cells	0	/sec	TR_FREQUENCY	24
ATM Port	105	errorsIn	Errors In	Errors In	493	8	Cells	0	/sec	DLL_ERRORS	10
ATM Port	105	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
ATM Port	105	errorsOut	Errors Out	Errors Out	494	8	Cells	0	/sec	TR_FREQUENCY-DLL_ERRORS	64
ATM Port	105	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
ATM Port	105	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100 0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
ATM Port	105	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
ATM Port	105	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
ATM Port	105	policyViolations	Policy Violations	Policy Vltns	417	8	Cells	0	/sec	TR_LLC_FRAMES	26
ATM Port	105	policyViolationsIn	Policy Violations In	Policy Vltns In	418	8	Cells	0	/sec	PACKETS_IN	27
ATM Port	105	policyViolationsInPct	Policy Violations In %	Plcy Vltns In %	624	4	Percent	1	%	100.0*DELTA_TIME*PACKETS_IN/DLL_FRAMES	235
ATM Port	105	policyViolationsOut	Policy Violations Out	Policy Vltns Out	419	8	Cells	0	/sec	TR_LLC_FRAMES-PACKETS_IN	130
ATM Port	105	policyViolationsOutPct	Policy Violations Out %	Plcy Vltns Out %	625	4	Percent	1	%	100 0*DELTA_TIME*(TR_LLC_FRAMES-PACKETS_IN)/(TR_LOST_FRAME-DLL_FRAMES)	236
ATM Port	105	policyViolationsPct	Policy Violations %	Plcy Vltns %	623	4	Percent	1	%	100.0*DELTA_TIME*TR_LLC_FRAMES/TR_LOST_FRAME	234

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
ATM Port	105	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
ATM Port	105	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
ATM Port	105	sevErroredSeconds	Severely Errored Seconds	Sev Err Seconds	300	4	Percent	1	%	DLL_TRANSITS*100.0	155
ATM Port	105	unavailableSeconds	Unavailable Seconds	Unavail Seconds	302	4	Percent	1	%	DLL_ENET_FRAMES*100.0	154
ATM Path	106	aal5Pdus	AAL5 PDUs	AAL5 PDUs	432	8	Cells	0	/sec	DLL_MCASTS+DLL_COLLISIONS	237
ATM Path	106	aal5PdusDiscarded	Discarded AAL5 PDUs	AAL5PDUs Dsc	433	8	Cells	0	/sec	DLL_FRAMES+DLL_BYTES	249
ATM Path	106	aal5PdusDiscardedIn	Discarded AAL5 PDUs In	AAL5PDUs Dsc In	311	8	Cells	0	/sec	DLL_FRAMES	1
ATM Path	106	aal5PdusDiscardedInPct	Discarded AAL5 PDUs In %	AAL5PDU Dsc In %	615	4	Percent	1	%	100.0*DELTA_TIME*DLL_FRAMES/DLL_MCASTS	251
ATM Path	106	aal5PdusDiscardedOut	Discarded AAL5 PDUs Out	AAL5PDUs Dsc Out	312	8	Cells	0	/sec	DLL_BYTES	2
ATM Path	106	aal5PdusDiscardedOutPct	Discarded AAL5 PDUs Out %	AAL5PDU Dsc Out%	616	4	Percent	1	%	100 0*DELTA_TIME*DLL_BYTES/DLL_COLLISIONS	252
ATM Path	106	aal5PdusDiscardedPct	Discarded AAL5 PDUs %	AAL5PDU Dsc %	614	4	Percent	1	%	100.0*DELTA_TIME*(DLL_FRAMES+DLL_BYTES)/(DLL_MCASTS+DLL_COLLISIONS)	250
ATM Path	106	aal5PdusIn	AAL5 PDUs In	AAL5 PDUs In	309	8	Cells	0	/sec	DLL_MCASTS	3
ATM Path	106	aal5PdusOut	AAL5 PDUs Out	AAL5 PDUs Out	310	8	Cells	0	/sec	DLL_COLLISIONS	9
ATM Path	106	allocatedChannels	Allocated Channels	Allocated Chnls	188	19	Size	4		(TR_BURST+TR_CONGESTION)	96
ATM Path	106	allocatedChannelsIn	Allocated Channels In	Alloc Chan In	203	19	Size	4		TR_BURST	17
ATM Path	106	allocatedChannelsOut	Allocated Channels Out	Alloc Chan Out	207	19	Size	4		TR_CONGESTION	21
ATM Path	106	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
ATM Path	106	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
ATM Path	106	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	(((BYTES_IN+BYTES_OUT)*8*100.0)/$(speedTotal))	91
ATM Path	106	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((BYTES_IN*8*100.0)/$(speedIn))	90
ATM Path	106	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	((BYTES_OUT*8*100.0)/$(speedOut))	89
ATM Path	106	bits	Bits	Bits	437	15	Bits	0	/sec	((BYTES_IN+BYTES_OUT)*8.0)	162
ATM Path	106	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(BYTES_IN*8.0)	164
ATM Path	106	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(BYTES_OUT*8.0)	167
ATM Path	106	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
ATM Path	106	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	BYTES_IN	28
ATM Path	106	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	BYTES_OUT	30
ATM Path	106	cells	Cells	Cells	184	0	Rate	0	/sec	PACKETS_IN+PACKETS_OUT	70
ATM Path	106	cellsIn	Cells In	Cells In	200	0	Rate	0	/sec	PACKETS_IN	27
ATM Path	106	cellsOut	Cells Out	Cells Out	204	0	Rate	0	/sec	PACKETS_OUT	29
ATM Path	106	clp0Cells	CLP0 Cells	CLP0 Cells	423	8	Cells	0	/sec	(PACKETS_IN+PACKETS_OUT)-TR_INTERNAL	140
ATM Path	106	clp0CellsIn	CLP0 Cells In	CLP0 Cells In	424	8	Cells	0	/sec	PACKETS_IN-TR_ABORT	141
ATM Path	106	clp0CellsOut	CLP0 Cells Out	CLP0 Cells Out	425	8	Cells	0	/sec	PACKETS_OUT-(TR_INTERNAL-TR_ABORT)	142
ATM Path	106	clp0Discards	CLP0 Discards	CLP0 Discards	420	8	Cells	0	/sec	(TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)-TR_BIT_STREAMING	144
ATM Path	106	clp0DiscardsIn	CLP0 Discards In	CLP0 Discards In	421	8	Cells	0	/sec	TR_SET_RECOVERY_MODE-TR_CONTENTION_STREAMING	143
ATM Path	106	clp0DiscardsInPct	CLP0 Discards In %	CLP0 Dscds In %	621	4	Percent	1	%	100.0*DELTA_TIME*(TR_SET_RECOVERY_MODE-TR_CONTENTION_STREAMING)/(PACKETS_IN-TR_ABORT)	257
ATM Path	106	clp0DiscardsOut	CLP0 Discards Out	CLP0 Discards Ou	422	8	Cells	0	/sec	TR_SIGNAL_LOSS-(TR_BIT_STREAMING-TR_CONTENTION_STREAMING)	145
ATM Path	106	clp0DiscardsOutPct	CLP0 Discards Out %	CLP0 Dscds Out %	622	4	Percent	1	%	100.0*DELTA_TIME*(TR_SIGNAL_LOSS-(TR_BIT_STREAMING-TR_CONTENTION_STREAMING))/(PACKETS_OUT-(TR_INTERNAL-TR_ABORT))	258
ATM Path	106	clp0DiscardsPct	CLP0 Discards %	CLP0 Dscds %	620	4	Percent	1	%	100.0*DELTA_TIME*((TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)-TR_BIT_STREAMING)/((PACKETS_IN+PACKETS_OUT)-TR_INTERNAL)	256
ATM Path	106	clp1Cells	CLP1 Cells	CLP1 Cells	411	8	Cells	0	/sec	TR_INTERNAL	18
ATM Path	106	clp1CellsIn	CLP1 Cells In	CLP1 Cells In	412	8	Cells	0	/sec	TR_ABORT	19
ATM Path	106	clp1CellsInPct	CLP1 Cells In %	CLP1 Cells In %	717	4	Percent	1	%	100.0*TR_ABORT/PACKETS_IN	322
ATM Path	106	clp1CellsOut	CLP1 Cells Out	CLP1 Cells Out	413	8	Cells	0	/sec	TR_INTERNAL-TR_ABORT	138
ATM Path	106	clp1CellsOutPct	CLP1 Cells Out %	CLP1 Cells Out %	718	4	Percent	1	%	100.0*(TR_INTERNAL-TR_ABORT)/PACKETS_OUT	323

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
ATM Path	106	clp1CellsPct	CLP1 Cells %	CLP1 Cells %	716	4	Percent	1	%	100.0*TR_INTERNAL/(PACKETS_IN+PACKETS_OUT)	321
ATM Path	106	clp1Discards	CLP1 Discards	CLP1 Disc	409	8	Cells	0	/sec	TR_BIT_STREAMING	14
ATM Path	106	clp1DiscardsIn	CLP1 Discards In	CLP1 Disc In	408	8	Cells	0	/sec	TR_CONTENTION_STREAMING	15
ATM Path	106	clp1DiscardsInPct	CLP1 Discards In %	CLP1 Dscds In %	618	4	Percent	1	%	100.0*DELTA_TIME*TR_LINE/TR_INTERNAL	229
ATM Path	106	clp1DiscardsOut	CLP1 Discards Out	CLP1 Disc Out	410	8	Cells	0	/sec	TR_BIT_STREAMING-TR_CONTENTION_STREAMING	137
ATM Path	106	clp1DiscardsOutPct	CLP1 Discards Out %	CLP1 Dscds Out %	619	4	Percent	1	%	100.0*DELTA_TIME*(TR_CONTENTION_STREAMING-TR_LINE)/(TR_BURST-TR_INTERNAL)	230
ATM Path	106	clp1DiscardsPct	CLP1 Discards %	CLP1 Dscds %	617	4	Percent	1	%	100.0*DELTA_TIME*TR_CONTENTION_STREAMING/TR_BURST	228
ATM Path	106	discardedCells	Discarded Cells	Discarded Cells	186	0	Rate	0	/sec	(TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)	94
ATM Path	106	discardedCellsIn	Discarded Cells In	Disc Cells In	201	0	Rate	0	/sec	TR_SET_RECOVERY_MODE	12
ATM Path	106	discardedCellsOut	Discarded Cells Out	Disc Cells Out	205	0	Rate	0	/sec	TR_SIGNAL_LOSS	13
ATM Path	106	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*TR_SET_RECOVERY_MODE/PACKETS_IN	197
ATM Path	106	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*TR_SIGNAL_LOSS/PACKETS_OUT	198
ATM Path	106	discardsPct	Discards %	Discards %	604	4	Percent	1	%	100 0*DELTA_TIME*(TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)/((PACKETS_IN+PACKETS_OUT))	245
ATM Path	106	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
ATM Path	106	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
ATM Path	106	maximumChannels	Maximum Channels	Maximum Channels	187	0	Rate	0	/sec	(TR_LINE+TR_ADDRESS_COPIED)	95
ATM Path	106	maximumChannelsIn	Maximum Channels In	Max Channels In	202	0	Rate	0	/sec	TR_LINE	16
ATM Path	106	maximumChannelsOut	Maximum Channels Out	Max Channels Out	206	0	Rate	0	/sec	TR_ADDRESS_COPIED	20
ATM Path	106	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
ATM Path	106	policyViolations	Policy Violations	Policy Vltns	417	8	Cells	0	/sec	TR_FREQUENCY	24
ATM Path	106	policyViolationsIn	Policy Violations In	Policy Vltns In	418	8	Cells	0	/sec	TR_FRAME_COPIED	25
ATM Path	106	policyViolationsInPct	Policy Violations In %	Plcy Vltns In %	624	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/PACKETS_IN	260
ATM Path	106	policyViolationsOut	Policy Violations Out	Policy Vltns Out	419	8	Cells	0	/sec	TR_FREQUENCY-TR_FRAME_COPIED	61
ATM Path	106	policyViolationsOutPct	Policy Violations Out %	Plcy Vltns Out %	625	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-TR_FRAME_COPIED)/PACKETS_OUT	261
ATM Path	106	policyViolationsPct	Policy Violations %	Plcy Vltns %	623	4	Percent	1	%	100.0*DELTA_TIME*TR_FREQUENCY/(PACKETS_IN+PACKETS_OUT)	259
ATM Path	106	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
ATM Path	106	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
ATM Channel	107	aal5Pdus	AAL5 PDUs	AAL5 PDUs	432	8	Cells	0	/sec	DLL_MCASTS+DLL_COLLISIONS	237
ATM Channel	107	aal5PdusDiscarded	Discarded AAL5 PDUs	AAL5PDUs Dsc	433	8	Cells	0	/sec	DLL_FRAMES+DLL_BYTES	238
ATM Channel	107	aal5PdusDiscardedIn	Discarded AAL5 PDUs In	AAL5PDUs Dsc In	311	8	Cells	0	/sec	DLL_FRAMES	1
ATM Channel	107	aal5PdusDiscardedInPct	Discarded AAL5 PDUs In %	AAL5PDU Dsc In %	615	4	Percent	1	%	100.0*DELTA_TIME*DLL_FRAMES/DLL_MCASTS	240
ATM Channel	107	aal5PdusDiscardedOut	Discarded AAL5 PDUs Out	AAL5PDUs Dsc Out	312	8	Cells	0	/sec	DLL_BYTES	2
ATM Channel	107	aal5PdusDiscardedOutPct	Discarded AAL5 PDUs Out %	AAL5PDU Dsc Out%	616	4	Percent	1	%	100.0*DELTA_TIME*DLL_BYTES/DLL_COLLISIONS	241
ATM Channel	107	aal5PdusDiscardedPct	Discarded AAL5 PDUs %	AAL5PDU Dsc %	614	4	Percent	1	%	100.0*DELTA_TIME*(DLL_FRAMES+DLL_BYTES)/(DLL_MCASTS+DLL_COLLISIONS)	239
ATM Channel	107	aal5PdusIn	AAL5 PDUs In	AAL5 PDUs In	309	8	Cells	0	/sec	DLL_MCASTS	3
ATM Channel	107	aal5PdusOut	AAL5 PDUs Out	AAL5 PDUs Out	310	8	Cells	0	/sec	DLL_COLLISIONS	9
ATM Channel	107	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100 0)	77
ATM Channel	107	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
ATM Channel	107	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	(((BYTES_IN+BYTES_OUT)*8*100.0)/${speedTotal})	91
ATM Channel	107	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((BYTES_IN*8*100.0)/${speedIn})	90
ATM Channel	107	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	((BYTES_OUT*8*100.0)/${speedOut})	89
ATM Channel	107	bits	Bits	Bits	437	15	Bits	0	/sec	((BYTES_IN+BYTES_OUT)*8.0)	162
ATM Channel	107	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(BYTES_IN*8.0)	164
ATM Channel	107	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(BYTES_OUT*8.0)	167
ATM Channel	107	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
ATM Channel	107	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	BYTES_IN	28
ATM Channel	107	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	BYTES_OUT	30

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
ATM Channel	107	cells	Cells	Cells	184	0	Rate	0	/sec	PACKETS_IN+PACKETS_OUT	70
ATM Channel	107	cellsIn	Cells In	Cells In	200	0	Rate	0	/sec	PACKETS_IN	27
ATM Channel	107	cellsOut	Cells Out	Cells Out	204	0	Rate	0	/sec	PACKETS_OUT	29
ATM Channel	107	clp0Cells	CLP0 Cells	CLP0 Cells	423	8	Cells	0	/sec	(PACKETS_IN+PACKETS_OUT)-TR_BURST	147
ATM Channel	107	clp0CellsIn	CLP0 Cells In	CLP0 Cells In	424	8	Cells	0	/sec	PACKETS_IN-TR_INTERNAL	148
ATM Channel	107	clp0CellsOut	CLP0 Cells Out	CLP0 Cells Out	425	8	Cells	0	/sec	PACKETS_OUT-(TR_BURST-TR_INTERNAL)	149
ATM Channel	107	clp0Discards	CLP0 Discards	CLP0 Discards	420	8	Cells	0	/sec	(TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)-TR_CONTENTION_STREAMING	150
ATM Channel	107	clp0DiscardsIn	CLP0 Discards In	CLP0 Discards In	421	8	Cells	0	/sec	TR_SET_RECOVERY_MODE-TR_LINE	151
ATM Channel	107	clp0DiscardsInPct	CLP0 Discards In %	CLP0 Dscds In %	621	4	Percent	1	%	100.0*DELTA_TIME*(TR_SET_RECOVERY_MODE-TR_LINE)/(PACKETS_IN-TR_INTERNAL)	243
ATM Channel	107	clp0DiscardsOut	CLP0 Discards Out	CLP0 Discards Ou	422	8	Cells	0	/sec	TR_SIGNAL_LOSS-(TR_CONTENTION_STREAMING-TR_LINE)	152
ATM Channel	107	clp0DiscardsOutPct	CLP0 Discards Out %	CLP0 Dscds Out %	622	4	Percent	1	%	100.0*DELTA_TIME*(TR_SIGNAL_LOSS-(TR_CONTENTION_STREAMING-TR_LINE))/(PACKETS_OUT-(TR_BURST-TR_INTERNAL))	244
ATM Channel	107	clp0DiscardsPct	CLP0 Discards %	CLP0 Dscds %	620	4	Percent	1	%	100.0*DELTA_TIME*((TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)-TR_CONTENTION_STREAMING)/((PACKETS_IN+PACKETS_OUT)-TR_BURST)	242
ATM Channel	107	clp1Cells	CLP1 Cells	CLP1 Cells	411	8	Cells	0	/sec	TR_BURST	17
ATM Channel	107	clp1CellsIn	CLP1 Cells In	CLP1 Cells In	412	8	Cells	0	/sec	TR_INTERNAL	18
ATM Channel	107	clp1CellsInPct	CLP1 Cells In %	CLP1 Cells In %	717	4	Percent	1	%	100.0*TR_INTERNAL/PACKETS_IN	325
ATM Channel	107	clp1CellsOut	CLP1 Cells Out	CLP1 Cells Out	413	8	Cells	0	/sec	TR_BURST-TR_INTERNAL	128
ATM Channel	107	clp1CellsOutPct	CLP1 Cells Out %	CLP1 Cells Out %	718	4	Percent	1	%	100.0*(TR_BURST-TR_INTERNAL)/PACKETS_OUT	326
ATM Channel	107	clp1CellsPct	CLP1 Cells %	CLP1 Cells %	716	4	Percent	1	%	100.0*TR_BURST/(PACKETS_IN+PACKETS_OUT)	324
ATM Channel	107	clp1Discards	CLP1 Discards	CLP1 Disc	409	8	Cells	0	/sec	TR_CONTENTION_STREAMING	15
ATM Channel	107	clp1DiscardsIn	CLP1 Discards In	CLP1 Disc In	408	8	Cells	0	/sec	TR_LINE	16
ATM Channel	107	clp1DiscardsInPct	CLP1 Discards In %	CLP1 Dscds In %	618	4	Percent	1	%	100.0*DELTA_TIME*TR_LINE/TR_INTERNAL	229
ATM Channel	107	clp1DiscardsOut	CLP1 Discards Out	CLP1 Disc Out	410	8	Cells	0	/sec	TR_CONTENTION_STREAMING-TR_LINE	127
ATM Channel	107	clp1DiscardsOutPct	CLP1 Discards Out %	CLP1 Dscds Out %	619	4	Percent	1	%	100.0*DELTA_TIME*(TR_CONTENTION_STREAMING-TR_LINE)/(TR_BURST-TR_INTERNAL)	230
ATM Channel	107	clp1DiscardsPct	CLP1 Discards %	CLP1 Dscds %	617	4	Percent	1	%	100.0*DELTA_TIME*TR_CONTENTION_STREAMING/TR_BURST	228
ATM Channel	107	discardedCells	Discarded Cells	Discarded Cells	186	0	Rate	0	/sec	(TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)	94
ATM Channel	107	discardedCellsIn	Discarded Cells In	Disc Cells In	201	0	Rate	0	/sec	TR_SET_RECOVERY_MODE	12
ATM Channel	107	discardedCellsOut	Discarded Cells Out	Disc Cells Out	205	0	Rate	0	/sec	TR_SIGNAL_LOSS	13
ATM Channel	107	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*TR_SET_RECOVERY_MODE/PACKETS_IN	197
ATM Channel	107	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*TR_SIGNAL_LOSS/PACKETS_OUT	198
ATM Channel	107	discardsPct	Discards %	Discards %	604	4	Percent	1	%	100.0*DELTA_TIME*(TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)/((PACKETS_IN+PACKETS_OUT))	245
ATM Channel	107	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
ATM Channel	107	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
ATM Channel	107	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
ATM Channel	107	policyViolations	Policy Violations	Policy Vltns	417	8	Cells	0	/sec	TR_CONGESTION	21
ATM Channel	107	policyViolationsIn	Policy Violations In	Policy Vltns In	418	8	Cells	0	/sec	TR_LOST_FRAME	22
ATM Channel	107	policyViolationsInPct	Policy Violations In %	Plcy Vltns In %	624	4	Percent	1	%	100.0*DELTA_TIME*TR_LOST_FRAME/PACKETS_IN	247
ATM Channel	107	policyViolationsOut	Policy Violations Out	Policy Vltns Out	419	8	Cells	0	/sec	TR_CONGESTION-TR_LOST_FRAME	146
ATM Channel	107	policyViolationsOutPct	Policy Violations Out %	Plcy Vltns Out %	625	4	Percent	1	%	100.0*DELTA_TIME*(TR_CONGESTION-TR_LOST_FRAME)/PACKETS_OUT	248
ATM Channel	107	policyViolationsPct	Policy Violations %	Plcy Vltns %	623	4	Percent	1	%	100.0*DELTA_TIME*TR_CONGESTION/(PACKETS_IN+PACKETS_OUT)	246
ATM Channel	107	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100 0*DELTA_TIME/(TOTAL_TIME*1.0))	76
ATM Channel	107	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Router	200	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Router	200	avgLineUtilization	Av Line Utilization	Av Line Util	66	4	Percent	1	%	DLL_BCASTS	4
Router	200	avgPacketDiscardRate	Av Packet Discard Rate	Av Pkt Dscrd Rte	67	4	Percent	1	%	DLL_RCV_OFF_FRAMES	5
Router	200	avgPacketFault	Av Packet Error Rate	Av Pkt Error	68	4	Percent	1	%	DLL_XMT_OFF_FRAMES	6
Router	200	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Router	200	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
Router	200	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
Router	200	errors	Total Errors	Ttl Errors	125	2	Frames	0	/sec	TR_FREQUENCY	24
Router	200	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
Router	200	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
Router	200	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	64
Router	200	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
Router	200	forwardedAtalkPackets	Forwarded Appletalk Pkts	Frwrd Apple Pkts	75	2	Frames	0	/sec	TR_ADDRESS_COPIED	20
Router	200	forwardedDecnetPackets	Forwarded Decnet Pkts	Frwrd Decnt Pkts	73	2	Frames	0	/sec	TR_INTERNAL	18
Router	200	forwardedIpPackets	Forwarded IP Pkts	Frwrd IP Pkts	72	2	Frames	0	/sec	TR_BURST	17
Router	200	forwardedIpxPackets	Forwarded IPX Pkts	Frwrd IPX Pkts	76	2	Frames	0	/sec	TR_CONGESTION	21
Router	200	forwardedXnsPackets	Forwarded XNS Pkts	Frwrd XNS Pkts	74	2	Frames	0	/sec	TR_ABORT	19
Router	200	frames	Total Frames	Ttl Frames	123	2	Frames	0	/sec	TR_LOST_FRAME	22
Router	200	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Router	200	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Router	200	learningBridgedPackets	Learning Bridged Pkts	Lrng Brdgd Pkts	71	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Router	200	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Router	200	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	TR_LLC_FRAMES	26
Router	200	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
Router	200	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(TR_LLC_FRAMES-DLL_MCASTS)	88
Router	200	otherControlPackets	Other&Control Pkts	Other&Cntrl Pkts	117	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)-TR_BURST-TR_CONGESTION-TR_CONTENTION_STREAMING	33
Router	200	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Router	200	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Router	200	totalBytes	Total Bytes	Ttl Bytes	124	1	Bytes	0	/sec	TR_TOKEN	23
Router	200	totalFramesDiscarded	Total Frames Discarded	Ttl Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Router	200	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	DLL_BYTES	2
Router	200	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	DLL_FRAMES	1
Router	200	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
Router	200	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
Router	200	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Router	201	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Router	201	avgLineUtilization	Av Line Utilization	Av Line Util	66	4	Percent	1	%	DLL_BCASTS	4
Router	201	avgPacketDiscardRate	Av Packet Discard Rate	Av Pkt Dscrd Rte	67	4	Percent	1	%	DLL_RCV_OFF_FRAMES	5
Router	201	avgPacketFault	Av Packet Error Rate	Av Pkt Error	68	4	Percent	1	%	DLL_XMT_OFF_FRAMES	6
Router	201	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Router	201	bridgedPackets	Bridged Pkts	Bridged Pkts	87	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Router	201	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
Router	201	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
Router	201	errors	Total Errors	Ttl Errors	125	2	Frames	0	/sec	TR_FREQUENCY	24
Router	201	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
Router	201	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
Router	201	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	64
Router	201	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
Router	201	fastPacketsIn	Fast Pkts In	Fast Pkts In	85	2	Frames	0	/sec	TR_SIGNAL_LOSS	13
Router	201	fastPacketsOut	Fast Pkts Out	Fast Pkts Out	86	2	Frames	0	/sec	TR_BIT_STREAMING	14

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Router	201	forwardedAtalkPackets	Forwarded Appletalk Pkts	Frwrd Apple Pkts	75	2	Frames	0	/sec	TR_ADDRESS_COPIED	20
Router	201	forwardedDecnetPackets	Forwarded Decnet Pkts	Frwrd Decnt Pkts	73	2	Frames	0	/sec	TR_INTERNAL	18
Router	201	forwardedIpPackets	Forwarded IP Pkts	Frwrd IP Pkts	72	2	Frames	0	/sec	TR_BURST	17
Router	201	forwardedIpxPackets	Forwarded IPX Pkts	Frwrd IPX Pkts	76	2	Frames	0	/sec	TR_CONGESTION	21
Router	201	forwardedXnsPackets	Forwarded XNS Pkts	Frwrd XNS Pkts	74	2	Frames	0	/sec	TR_ABORT	19
Router	201	frames	Total Frames	Ttl Frames	123	2	Frames	0	/sec	TR_LOST_FRAME	22
Router	201	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Router	201	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Router	201	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Router	201	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	TR_LLC_FRAMES	26
Router	201	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
Router	201	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(TR_LLC_FRAMES-DLL_MCASTS)	88
Router	201	otherControlPackets	Other&Control Pkts	Other&Cntrl Pkts	117	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)-TR_BURST-TR_CONGESTION-TR_CONTENTION_STREAMING	33
Router	201	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Router	201	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Router	201	slowPacketsIn	Slow Pkts In	Slow Pkts In	83	2	Frames	0	/sec	DLL_ALGN_ERRORS	11
Router	201	slowPacketsOut	Slow Pkts Out	Slow Pkts Out	84	2	Frames	0	/sec	TR_SET_RECOVERY_MODE	12
Router	201	totalBytes	Total Bytes	Ttl Bytes	124	1	Bytes	0	/sec	TR_TOKEN	23
Router	201	totalFramesDiscarded	Total Frames Discarded	Ttl Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Router	201	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	DLL_BYTES	2
Router	201	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	DLL_FRAMES	1
Router	201	totalInputQueueDrops	Total Input Queue Drops	Ttl In Q Drops	81	0	Rate	0	/sec	DLL_TRANSITS	7
Router	201	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
Router	201	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
Router	201	totalOutputQueueDrops	Total Output Queue Drops	Ttl Out Q Drops	82	0	Rate	0	/sec	DLL_ENET_FRAMES	8
Router	201	totalQueueDropInOut	Total Queue Drops In&Out	Ttl Queue Drop	115	2	Frames	0	/sec	DLL_TRANSITS+DLL_ENET_FRAMES	31
Router	201	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Switch Plus Backplane	202	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Switch Plus Backplane	202	backplaneUtilization	Backplane Utilization	Backplane Util	540	4	Percent	1	%	DLL_BCASTS	4
Switch Plus Backplane	202	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Switch Plus Backplane	202	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Switch Plus Backplane	202	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Switch Plus Backplane	202	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Switch Plus Backplane	202	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Switch Plus Backplane	202	totalBytes	Total Bytes	Ttl Bytes	124	1	Bytes	0	/sec	TR_TOKEN	23
Router CPU	250	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Router CPU	250	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Router CPU	250	bufferCreateFailures	Buffer Create Failures	Buf Create Fail	93	5	Per Second	1		BYTES_OUT	30
Router CPU	250	buffersUsed	Buffers Used	Buffers Used	89	6	Buffers	4		TR_CONTENTION_STREAMING	15
Router CPU	250	bufferUtilization	Buffer Utilization	Buffer Util	108	4	Percent	1	%	(FLOAT4(TR_CONTENTION_STREAMING)/FLOAT4(TR_BIT_STREAMING))*DELTA_TIME*100.0	34
Router CPU	250	busDrops	Bus Drops	Bus Drops	90	5	Per Second	1		DLL_ALGN_ERRORS	11
Router CPU	250	cpuUtilization	CPU Utilization	CPU Utilization	91	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Router CPU	250	freeMemory	Free Memory	Free Memory	92	7	Bytes	4	(bytes)	TR_SIGNAL_LOSS*1000.0	86
Router CPU	250	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Router CPU	250	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Router CPU	250	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Router CPU	250	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Router CPU	250	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Router CPU	250	totalBuffers	Total Buffers	Total Buffers	88	6	Buffers	4		TR_BIT_STREAMING	14
Router CPU	251	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Router CPU	251	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Router CPU	251	bigBufferHits	Big Buffer Hits	Big Buffer Hits	98	5	Per Second	1		TR_ADDRESS_COPIED	20
Router CPU	251	bigBufferMisses	Big Buffer Misses	Big Buffer Misse	99	5	Per Second	1		TR_CONGESTION	21
Router CPU	251	bufferCreateFailures	Buffer Create Failures	Buf Create Fail	93	5	Per Second	1		BYTES_OUT	30
Router CPU	251	bufferHits	Buffer Hits	Buffer Hits	435	5	Per Second	1		(TR_LINE+TR_ADDRESS_COPIED+TR_INTERNAL+TR_LOST_FRAME+TR_FREQUENCY)	158
Router CPU	251	bufferMisses	Buffer Misses	Buffer Misses	436	5	Per Second	1		(TR_BURST+TR_CONGESTION+TR_ABORT+TR_TOKEN+TR_FRAME_COPIED)	159
Router CPU	251	buffersUsed	Buffers Used	Buffers Used	89	6	Buffers	4		TR_CONTENTION_STREAMING	15
Router CPU	251	busDrops	Bus Drops	Bus Drops	90	5	Per Second	1		DLL_ALGN_ERRORS	11
Router CPU	251	cpuUtilization	CPU Utilization	CPU Utilization	91	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Router CPU	251	freeMemory	Free Memory	Free Memory	92	7	Bytes	4	(bytes)	TR_SIGNAL_LOSS*1000.0	86
Router CPU	251	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Router CPU	251	hugeBufferHits	Huge Buffer Hits	Huge Buffer Hits	102	5	Per Second	1		TR_FREQUENCY	24
Router CPU	251	hugeBufferMisses	Huge Buffer Misses	Huge Buffer Miss	103	5	Per Second	1		TR_FRAME_COPIED	25
Router CPU	251	largeBufferHits	Large Buffer Hits	Lge Buffer Hits	100	5	Per Second	1		TR_LOST_FRAME	22
Router CPU	251	largeBufferMisses	Large Buffer Misses	Lge Buffer Miss	101	5	Per Second	1		TR_TOKEN	23
Router CPU	251	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Router CPU	251	mediumBufferHits	Medium Buffer Hits	Med Buffer Hits	96	5	Per Second	1		TR_INTERNAL	18
Router CPU	251	mediumBufferMisses	Medium Buffer Misses	Med Buffer Mits	97	5	Per Second	1		TR_ABORT	19
Router CPU	251	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Router CPU	251	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Router CPU	251	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Router CPU	251	smallBufferHits	Small Buffer Hits	Sm Buffer Hits	94	5	Per Second	1		TR_LINE	16
Router CPU	251	smallBufferMisses	Small Buffer Misses	Sm Buffer Mits	95	5	Per Second	1		TR_BURST	17
Router CPU	251	totalBuffers	Total Buffers	Total Buffers	88	6	Buffers	4		TR_BIT_STREAMING	14
Switch CPU	252	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Switch CPU	252	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Switch CPU	252	cpuUtilization	CPU Utilization	CPU Utilization	91	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Switch CPU	252	fanStatus	Fan Status	Fan Status	537	0	Rate	0	/sec	DLL_MCASTS	3
Switch CPU	252	freeMemory	Free Memory	Free Memory	92	7	Bytes	4	(bytes)	TR_LINE	16
Switch CPU	252	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Switch CPU	252	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Switch CPU	252	memoryUsed	Memory Used	Memory Used	375	7	Bytes	4	(bytes)	TR_BURST	17
Switch CPU	252	memoryUtilization	Memory Utilization	Memory Util	168	4	Percent	1	%	(100*(TR_CONTENTION_STREAMING/TR_BIT_STREAMING))	199
Switch CPU	252	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Switch CPU	252	powerSupply1Status	Power Supply 1 Status	Pwr Spply 1 Stat	535	0	Rate	0	/sec	DLL_FRAMES	1
Switch CPU	252	powerSupply2Status	Power Supply 2 Status	Pwr Spply 2 Stat	536	0	Rate	0	/sec	DLL_BYTES	2
Switch CPU	252	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Switch CPU	252	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Switch CPU	252	temperatureStatus	Temperature Status	Temp Status	538	0	Rate	0	/sec	DLL_BCASTS	4
Switch CPU	252	topologyChanges	Topology Changes	Topology Changes	539	2	Frames	0	/sec	DLL_RCV_OFF_FRAMES	5

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server	300	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14
Server	300	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	300	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	11
Server	300	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server	300	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	300	droppedConnections	Dropped Connections	Dropped Conn	148	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
Server	300	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	300	fileCacheAttempts	File Cache Attempts	Fle Cache Atts	143	0	Rate	0	/sec	DLL_TRANSITS+DLL_XMT_OFF_FRAMES	63
Server	300	fileCacheHits	File Cache Hits	Fle Cache Hits	141	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Server	300	fileCacheMisses	File Cache Misses	Fle Cache Missd	142	0	Rate	0	/sec	DLL_TRANSITS	7
Server	300	fileCacheMissRate	File Cache Miss Rate	File Cache Miss	158	4	Percent	1	%	100.0*DELTA_TIME*DLL_TRANSITS/(DLL_TRANSITS+DLL_XMT_OFF_FRAMES)	66
Server	300	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	300	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server	300	largeCommBuffersUsed	Large Comm Buffers Used	Lrge Com Buf Usd	167	5	Per Second	1		TR_ADDRESS_COPIED	20
Server	300	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server	300	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	300	pageFaults	Page Faults	Page Faults	146	5	Per Second	1		DLL_ERRORS	10
Server	300	pagesPagedIn	Pages Paged In	Pages Paged In	136	5	Per Second	1		DLL_FRAMES	1
Server	300	pagesPagedOut	Pages Paged Out	Pages Paged Out	137	5	Per Second	1		DLL_MCASTS	3
Server	300	pagesSwappedIn	Pages Swapped In	Pages Swd In	138	5	Per Second	1		DLL_BCASTS	4
Server	300	pagesSwappedOut	Pages Swapped Out	Pages Swd Out	139	5	Per Second	1		DLL_RCV_OFF_FRAMES	5
Server	300	physicalMemoryFree	Physical Memory Free	Phys Mem Free	708	7	Bytes	4	(bytes)	DLL_ENET_FRAMES-DLL_COLLISIONS	313
Server	300	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_COLLISIONS	9
Server	300	physicalMemoryUtilization	Physical Memory Utilization	Physical Memory	160	4	Percent	1	%	100 0*DELTA_TIME*DLL_COLLISIONS/DLL_ENET_FRAMES	68
Server	300	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server	300	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	300	smallCommBuffersDropped	Small Comm Buffers Dropped	Small Comm Buff	165	5	Per Second	1		TR_INTERNAL	18
Server	300	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	300	totalCommFault	Total Comm Errors	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY-TR_FRAME_COPIED	61
Server	300	totalFramesDiscarded	Total Frames Discarded	Ttl Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server	300	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	300	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	300	totalLargeCommBuffers	Total Large Comm Buffers	Ttl Lrge Com Buf	166	5	Per Second	1		TR_ABORT	19
Server	300	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	300	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	300	totalPhysicalMemory	Total Physical Memory	Total Phys Mem	144	7	Bytes	4	(bytes)	DLL_ENET_FRAMES	8
Server	300	totalVirtualMemory	Total Virtual Memory	Total Vir Mem	149	7	Bytes	4	(bytes)	TR_LINE	16
Server	300	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes	4	(bytes)	TR_BURST	17
Server	300	virtualMemoryUtilization	Virtual Memory Utilization	Virt Mem Util	161	4	Percent	1	%	100.0*DELTA_TIME*TR_BURST/TR_LINE	69
Server	301	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14
Server	301	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100 0)	77
Server	301	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	11
Server	301	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server	301	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	301	droppedConnections	Dropped Connections	Dropped Conn	148	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
Server	301	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	301	fileCacheAttempts	File Cache Attempts	Fle Cache Atts	143	0	Rate	0	/sec	DLL_TRANSITS+DLL_XMT_OFF_FRAMES	63
Server	301	fileCacheHits	File Cache Hits	Fle Cache Hits	141	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Server	301	fileCacheMisses	File Cache Misses	Fle Cache Missd	142	0	Rate	0	/sec	DLL_TRANSITS	7
Server	301	fileCacheMissRate	File Cache Miss Rate	File Cache Miss	158	4	Percent	1	%	100.0*DELTA_TIME*DLL_TRANSITS/(DLL_TRANSITS+DLL_XMT_OFF_FRAMES)	66

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server	301	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	301	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server	301	largeCommBuffersUsed	Large Comm Buffers Used	Lrge Com Buf Usd	167	5	Per Second	1		TR_ADDRESS_COPIED	20
Server	301	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server	301	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	301	physicalMemoryFree	Physical Memory Free	Phys Mem Free	708	7	Bytes	4	(bytes)	DLL_ENET_FRAMES-DLL_COLLISIONS	313
Server	301	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_COLLISIONS	9
Server	301	physicalMemoryUtilization	Physical Memory Utilization	Physical Memory	160	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_ENET_FRAMES	68
Server	301	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server	301	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	301	smallCommBuffersDropped	Small Comm Buffers Dropped	Small Comm Buff	165	5	Per Second	1		TR_INTERNAL	18
Server	301	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	301	totalCommFault	Total Comm Errors	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY-TR_FRAME_COPIED	61
Server	301	totalFramesDiscarded	Total Frames Discarded	Ttl Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server	301	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	301	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	301	totalLargeCommBuffers	Total Large Comm Buffers	Ttl Lrge Com Buf	166	5	Per Second	1		TR_ABORT	19
Server	301	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	301	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	301	totalPhysicalMemory	Total Physical Memory	Total Phys Mem	144	7	Bytes	4	(bytes)	DLL_ENET_FRAMES	8
Server	302	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14
Server	302	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	302	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	11
Server	302	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server	302	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	302	droppedConnections	Dropped Connections	Dropped Conn	148	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
Server	302	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	302	fileCacheAttempts	File Cache Attempts	File Cache Atts	143	0	Rate	0	/sec	DLL_TRANSITS+DLL_XMT_OFF_FRAMES	63
Server	302	fileCacheHits	File Cache Hits	File Cache Hits	141	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Server	302	fileCacheMisses	File Cache Misses	File Cache Missd	142	0	Rate	0	/sec	DLL_TRANSITS	7
Server	302	fileCacheMissRate	File Cache Miss Rate	File Cache Miss	158	4	Percent	1	%	100.0*DELTA_TIME*DLL_TRANSITS/(DLL_TRANSITS+DLL_XMT_OFF_FRAMES)	66
Server	302	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	302	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server	302	largeCommBuffersUsed	Large Comm Buffers Used	Lrge Com Buf Usd	167	5	Per Second	1		TR_ADDRESS_COPIED	20
Server	302	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server	302	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	302	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server	302	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	302	smallCommBuffersDropped	Small Comm Buffers Dropped	Small Comm Buff	165	5	Per Second	1		TR_INTERNAL	18
Server	302	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	302	totalCommFault	Total Comm Errors	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY-TR_FRAME_COPIED	61
Server	302	totalFramesDiscarded	Total Frames Discarded	Ttl Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server	302	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	302	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	302	totalLargeCommBuffers	Total Large Comm Buffers	Ttl Lrge Com Buf	166	5	Per Second	1		TR_ABORT	19
Server	302	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	302	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	303	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server	303	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	303	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	11
Server	303	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server	303	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	303	droppedConnections	Dropped Connections	Dropped Conn	148	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
Server	303	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	303	fileCacheAttempts	File Cache Attempts	Fle Cache Atts	143	0	Rate	0	/sec	DLL_TRANSITS+DLL_XMT_OFF_FRAMES	63
Server	303	fileCacheHits	File Cache Hits	Fle Cache Hits	141	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Server	303	fileCacheMisses	File Cache Misses	Fle Cache Missd	142	0	Rate	0	/sec	DLL_TRANSITS	7
Server	303	fileCacheMissRate	File Cache Miss Rate	File Cache Miss	158	4	Percent	1	%	100.0*DELTA_TIME*DLL_TRANSITS/(DLL_TRANSITS+DLL_XMT_OFF_FRAMES)	66
Server	303	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	303	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server	303	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server	303	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	303	pageFaults	Page Faults	Page Faults	146	5	Per Second	1		DLL_ERRORS	10
Server	303	pagesPagedIn	Pages Paged In	Pages Paged In	136	5	Per Second	1		DLL_FRAMES	1
Server	303	pagesPagedOut	Pages Paged Out	Pages Paged Out	137	5	Per Second	1		DLL_MCASTS	3
Server	303	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server	303	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	303	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	303	totalCommFault	Total Comm Errors	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY-TR_FRAME_COPIED	61
Server	303	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	303	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	303	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	303	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	304	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14
Server	304	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	304	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	11
Server	304	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server	304	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	304	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	304	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	304	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server	304	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server	304	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	304	pageFaults	Page Faults	Page Faults	146	5	Per Second	1		DLL_ERRORS	10
Server	304	pagesPagedIn	Pages Paged In	Pages Paged In	136	5	Per Second	1		DLL_FRAMES	1
Server	304	pagesPagedOut	Pages Paged Out	Pages Paged Out	137	5	Per Second	1		DLL_MCASTS	3
Server	304	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server	304	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	304	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	304	totalCommFault	Total Comm Errors	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY-TR_FRAME_COPIED	61
Server	304	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	304	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	304	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	304	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	304	totalVirtualMemory	Total Virtual Memory	Total Vir Mem	149	7	Bytes	4	(bytes)	TR_LINE	16
Server	304	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes	4	(bytes)	TR_BURST	17

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server	304	virtualMemoryUtilization	Virtual Memory Utilization	Virt Mem Util	161	4	Percent	1	%	100.0*DELTA_TIME*TR_BURST/TR_LINE	69
Server	305	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14
Server	305	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	305	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	11
Server	305	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server	305	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	305	droppedConnections	Dropped Connections	Dropped Conn	148	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
Server	305	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	305	fileCacheAttempts	File Cache Attempts	File Cache Atts	143	0	Rate	0	/sec	DLL_TRANSITS+DLL_XMT_OFF_FRAMES	63
Server	305	fileCacheHits	File Cache Hits	File Cache Hits	141	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Server	305	fileCacheMisses	File Cache Misses	File Cache Missd	142	0	Rate	0	/sec	DLL_TRANSITS	7
Server	305	fileCacheMissRate	File Cache Miss Rate	File Cache Miss	158	4	Percent	1	%	100.0*DELTA_TIME*DLL_TRANSITS/(DLL_TRANSITS+DLL_XMT_OFF_FRAMES)	66
Server	305	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	305	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server	305	interrupts	Interrupts	Interrupts	580	0	Rate	0	/sec	TR_SIGNAL_LOSS	13
Server	305	largeCommBuffersUsed	Large Comm Buffers Used	Lrge Com Buf Usd	167	5	Per Second	1		TR_ADDRESS_COPIED	20
Server	305	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server	305	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	305	pageFaults	Page Faults	Page Faults	146	5	Per Second	1		DLL_ERRORS	10
Server	305	pagesPagedIn	Pages Paged In	Pages Paged In	136	5	Per Second	1		DLL_FRAMES	1
Server	305	pagesPagedOut	Pages Paged Out	Pages Paged Out	137	5	Per Second	1		DLL_MCASTS	3
Server	305	pagesSwappedIn	Pages Swapped In	Pages Swd In	138	5	Per Second	1		DLL_BCASTS	4
Server	305	pagesSwappedOut	Pages Swapped Out	Pages Swd Out	139	5	Per Second	1		DLL_RCV_OFF_FRAMES	5
Server	305	physicalMemoryFree	Physical Memory Free	Phys Memory Free	599	7	Bytes	4	(bytes)	(DLL_ENET_FRAMES-DLL_COLLISIONS)	216
Server	305	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_COLLISIONS	9
Server	305	physicalMemoryUtilization	Physical Memory Utilization	Physical Memory	160	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_ENET_FRAMES	68
Server	305	processes	Processes	Processes	576	19	Size	4		TR_TOKEN	23
Server	305	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server	305	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	305	runQueueLength	CPU Run Queue Length	Run Queue Length	577	13	Gauge	1		DLL_BYTES	2
Server	305	smallCommBuffersDropped	Small Comm Buffers Dropped	Small Comm Buff	165	5	Per Second	1		TR_INTERNAL	18
Server	305	systemCalls	System Calls	System Calls	579	0	Rate	0	/sec	TR_LOST_FRAME	22
Server	305	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	305	totalCommFault	Total Comm Errors	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY-TR_FRAME_COPIED	61
Server	305	totalCpuUtilization	Total CPU Utilization	Total CPU Util	597	4	Percent	1	%	TR_LLC_FRAMES	26
Server	305	totalFramesDiscarded	Total Frames Discarded	Ttl Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server	305	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	305	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	305	totalLargeCommBuffers	Total Large Comm Buffers	Ttl Lrge Com Buf	166	5	Per Second	1		TR_ABORT	19
Server	305	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	305	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	305	totalPhysicalMemory	Total Physical Memory	Total Phys Mem	144	7	Bytes	4	(bytes)	DLL_ENET_FRAMES	8
Server	305	totalVirtualMemory	Total Virtual Memory	Total Vir Mem	149	7	Bytes	4	(bytes)	TR_LINE	16
Server	305	users	Users	Users	598	19	Size	4		TR_BIT_STREAMING	14
Server	305	virtualMemoryFree	Virtual Memory Free	Virt Memory Free	600	7	Bytes	4	(bytes)	(TR_LINE-TR_BURST)	217
Server	305	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes	4	(bytes)	TR_BURST	17
Server	305	virtualMemoryUtilization	Virtual Memory Utilization	Virt Mem Util	161	4	Percent	1	%	100.0*DELTA_TIME*TR_BURST/TR_LINE	69
Server	306	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14
Server	306	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	306	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	11
Server	306	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server	306	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	306	droppedConnections	Dropped Connections	Dropped Conn	148	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
Server	306	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	306	fileCacheAttempts	File Cache Attempts	File Cache Atts	143	0	Rate	0	/sec	DLL_TRANSITS+DLL_XMT_OFF_FRAMES	63
Server	306	fileCacheHits	File Cache Hits	File Cache Hits	141	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Server	306	fileCacheMisses	File Cache Misses	File Cache Missd	142	0	Rate	0	/sec	DLL_TRANSITS	7
Server	306	fileCacheMissRate	File Cache Miss Rate	File Cache Miss	158	4	Percent	1	%	100.0*DELTA_TIME*DLL_TRANSITS/(DLL_TRANSITS+DLL_XMT_OFF_FRAMES)	66
Server	306	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	306	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server	306	interrupts	Interrupts	Interrupts	580	0	Rate	0	/sec	TR_SIGNAL_LOSS	13
Server	306	largeCommBuffersUsed	Large Comm Buffers Used	Lrge Com Buf Usd	167	5	Per Second	1		TR_ADDRESS_COPIED	20
Server	306	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server	306	loadAverage	CPU Load Average	Load Average	574	13	Gauge	1		DLL_BYTES	2
Server	306	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	306	pageFaults	Page Faults	Page Faults	146	5	Per Second	1		DLL_ERRORS	10
Server	306	pageScanRate	Page Scan Rate	Page Scan Rate	578	0	Rate	0	/sec	TR_CONGESTION	21
Server	306	pagesPagedIn	Pages Paged In	Pages Paged In	136	5	Per Second	1		DLL_FRAMES	1
Server	306	pagesPagedOut	Pages Paged Out	Pages Paged Out	137	5	Per Second	1		DLL_MCASTS	3
Server	306	pagesSwappedIn	Pages Swapped In	Pages Swd In	138	5	Per Second	1		DLL_BCASTS	4
Server	306	pagesSwappedOut	Pages Swapped Out	Pages Swd Out	139	5	Per Second	1		DLL_RCV_OFF_FRAMES	5
Server	306	physicalMemoryFree	Physical Memory Free	Phys Memory Free	599	7	Bytes	4	(bytes)	(DLL_ENET_FRAMES-DLL_COLLISIONS)	216
Server	306	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_COLLISIONS	9
Server	306	physicalMemoryUtilization	Physical Memory Utilization	Physical Memory	160	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_ENET_FRAMES	68
Server	306	processes	Processes	Processes	576	19	Size	4		TR_TOKEN	23
Server	306	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server	306	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	306	smallCommBuffersDropped	Small Comm Buffers Dropped	Small Comm Buff	165	5	Per Second	1		TR_INTERNAL	18
Server	306	systemCalls	System Calls	System Calls	579	0	Rate	0	/sec	TR_LOST_FRAME	22
Server	306	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	306	totalCommFault	Total Comm Errors	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY-TR_FRAME_COPIED	61
Server	306	totalCpuUtilization	Total CPU Utilization	Total CPU Util	597	4	Percent	1	%	TR_LLC_FRAMES	26
Server	306	totalFramesDiscarded	Total Frames Discarded	Ttl Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server	306	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	306	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	306	totalLargeCommBuffers	Total Large Comm Buffers	Ttl Lrge Com Buf	166	5	Per Second	1		TR_ABORT	19
Server	306	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	306	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	306	totalPhysicalMemory	Total Physical Memory	Total Phys Mem	144	7	Bytes	4	(bytes)	DLL_ENET_FRAMES	8
Server	306	totalVirtualMemory	Total Virtual Memory	Total Vir Mem	149	7	Bytes	4	(bytes)	TR_LINE	16
Server	306	users	Users	Users	598	19	Size	4		TR_BIT_STREAMING	14
Server	306	virtualMemoryFree	Virtual Memory Free	Virt Memory Free	600	7	Bytes	4	(bytes)	(TR_LINE-TR_BURST)	217
Server	306	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes	4	(bytes)	TR_BURST	17
Server	306	virtualMemoryUtilization	Virtual Memory Utilization	Virt Mem Util	161	4	Percent	1	%	100.0*DELTA_TIME*TR_BURST/TR_LINE	69
Server CPU	330	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server CPU	330	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server CPU	330	cpuIdleUtilization	CPU Idle Utilization	CPU Idle Util	572	4	Percent	1	%	BYTES_IN	28
Server CPU	330	cpuSystemUtilization	CPU System Utilization	CPU System Util	583	4	Percent	1	%	TR_LLC_FRAMES	26
Server CPU	330	cpuUserUtilization	CPU User Utilization	CPU User Util	582	4	Percent	1	%	TR_FRAME_COPIED	25
Server CPU	330	cpuUtilization	CPU Utilization	CPU Utilization	128	4	Percent	1	%	TR_FREQUENCY	65
Server CPU	330	cpuWaitUtilization	CPU Wait Utilization	CPU Wait Util	584	4	Percent	1	%	PACKETS_IN	27
Server CPU	330	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server CPU	330	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server CPU	330	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server CPU	330	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server CPU	330	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
User Partition	350	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
User Partition	350	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
User Partition	350	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
User Partition	350	inodeUtilization	Inode Utilization	Inode Util	581	4	Percent	1	%	DLL_FRAMES	1
User Partition	350	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
User Partition	350	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
User Partition	350	partitionAllocationFailures	Partition Allocation Failures	Part Alloc Fails	157	5	Per Second	1		PACKETS_IN	27
User Partition	350	partitionReads	Partition Reads	Part Reads	154	0	Rate	0	/sec	BYTES_IN	28
User Partition	350	PartitionReadsWrites	Partition Reads&Writes	Part Reads&Wrts	156	0	Rate	0	/sec	BYTES_OUT	30
User Partition	350	partitionStorageCapacity	Partition Storage Capacity	Part Stor Cap	152	7	Bytes	4	(bytes)	TR_FREQUENCY	24
User Partition	350	partitionStorageFree	Partition Storage Free	Part Stor Free	601	7	Bytes	4	(bytes)	(TR_FREQUENCY-TR_FRAME_COPIED)	218
User Partition	350	partitionStorageUsed	Partition Storage Used	Part Stor Used	151	7	Bytes	4	(bytes)	TR_FRAME_COPIED	25
User Partition	350	partitionUtilization	Partition Utilization	Part Util	153	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	62
User Partition	350	partitionWrites	Partition Writes	Part Writes	155	0	Rate	0	/sec	PACKETS_OUT	29
User Partition	350	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
User Partition	350	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
BMC NT Partition	352	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
BMC NT Partition	352	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
BMC NT Partition	352	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
BMC NT Partition	352	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
BMC NT Partition	352	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
BMC NT Partition	352	partitionStorageCapacity	Partition Storage Capacity	Part Stor Cap	152	7	Bytes	4	(bytes)	TR_FREQUENCY	24
BMC NT Partition	352	partitionStorageUsed	Partition Storage Used	Part Stor Used	151	7	Bytes	4	(bytes)	TR_FRAME_COPIED	25
BMC NT Partition	352	partitionUtilization	Partition Utilization	Part Util	153	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	62
BMC NT Partition	352	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
BMC NT Partition	352	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
BMC UNIX Partition	353	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
BMC UNIX Partition	353	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
BMC UNIX Partition	353	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
BMC UNIX Partition	353	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
BMC UNIX Partition	353	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
BMC UNIX Partition	353	partitionStorageCapacity	Partition Storage Capacity	Part Stor Cap	152	7	Bytes	4	(bytes)	TR_FREQUENCY	24
BMC UNIX Partition	353	partitionStorageUsed	Partition Storage Used	Part Stor Used	151	7	Bytes	4	(bytes)	TR_FRAME_COPIED	25
BMC UNIX Partition	353	partitionUtilization	Partition Utilization	Part Util	153	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	62
BMC UNIX Partition	353	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
BMC UNIX Partition	353	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Disk	370	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Disk	370	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Disk	370	diskAvgTransferSize	Average Transfer Size	Avg Xfer Size	714	1	Bytes	0	/sec	DELTA_TIME*DLL_BYTES/BYTES_OUT	309
Disk	370	diskAvgTransferTime	Average Transfer Time	Avg Xfer Time	715	13	Gauge	1		1000.0*DELTA_TIME*DLL_MCASTS/BYTES_OUT	303
Disk	370	diskBusyTime	Disk I/O Busy Utilization	Disk Busy Time	567	4	Percent	1	%	100.0*DLL_MCASTS	317
Disk	370	diskBytesTransferred	Bytes Transferred	Bytes Xferd	703	1	Bytes	0	/sec	DLL_BYTES	2
Disk	370	diskFaults	Disk Faults	Disk Faults	135	5	Per Second	1		PACKETS_IN	27
Disk	370	diskQueueLength	Disk I/O Queue Length	Disk Q Length	568	0	Rate	0	/sec	DLL_BCASTS	4
Disk	370	diskReads	Disk Reads	Disk Reads	132	0	Rate	0	/sec	BYTES_IN	28
Disk	370	diskReadsWrites	Disk Reads&Writes	Disk Read&Write	134	0	Rate	0	/sec	BYTES_OUT	30
Disk	370	diskStorageCapacity	Disk Storage Capacity	Disk Stor Cap	130	7	Bytes	4	(bytes)	TR_FREQUENCY	24
Disk	370	diskStorageFree	Storage Free	Storage Free	709	7	Bytes	4	(bytes)	TR_FREQUENCY-TR_FRAME_COPIED	61
Disk	370	diskStorageUsed	Storage Used	Storage Used	710	7	Bytes	4	(bytes)	TR_FRAME_COPIED	25
Disk	370	diskStorageUtilization	Disk Storage Utilization	Disk Stor Util	131	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	62
Disk	370	diskWrites	Disk Writes	Disk Writes	133	0	Rate	0	/sec	PACKETS_OUT	29
Disk	370	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Disk	370	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Disk	370	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Disk	370	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100 0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Disk	370	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Disk	371	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Disk	371	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Disk	371	diskReadsWrites	Disk Reads&Writes	Disk Read&Write	134	0	Rate	0	/sec	BYTES_OUT	30
Disk	371	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Disk	371	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Disk	371	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Disk	371	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Disk	371	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server LAN	502	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server LAN	502	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
Server LAN	502	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
Server LAN	502	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
Server LAN	502	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server LAN	502	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speed))	87
Server LAN	502	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speedIn))	78
Server LAN	502	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
Server LAN	502	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
Server LAN	502	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
Server LAN	502	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
Server LAN	502	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
Server LAN	502	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_BYTES	2
Server LAN	502	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
Server LAN	502	collisionsOutPct	Collisions (out) %	Collisions Out %	720	4	Percent	1	%	100.0*DELTA_TIME*DLL_RCV_OFF_FRAMES/(TR_LOST_FRAME-DLL_FRAMES)	327

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server LAN	502	discardedFrames	Discarded Frames	Discarded Frames	57	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server LAN	502	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
Server LAN	502	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
Server LAN	502	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
Server LAN	502	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
Server LAN	502	errors	Errors	Errors	7	2	Frames	0	/sec	TR_FREQUENCY	24
Server LAN	502	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
Server LAN	502	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
Server LAN	502	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	64
Server LAN	502	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100 0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
Server LAN	502	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
Server LAN	502	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	DLL_FRAMES	1
Server LAN	502	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
Server LAN	502	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server LAN	502	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server LAN	502	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server LAN	502	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	DLL_BCASTS	4
Server LAN	502	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
Server LAN	502	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(DLL_BCASTS-DLL_MCASTS)	84
Server LAN	502	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1 0))	76
Server LAN	502	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server LAN	502	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Server LAN	504	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server LAN	504	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
Server LAN	504	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
Server LAN	504	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
Server LAN	504	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server LAN	504	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speedTotal))	79
Server LAN	504	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speedIn))	78
Server LAN	504	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
Server LAN	504	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
Server LAN	504	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
Server LAN	504	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
Server LAN	504	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
Server LAN	504	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_BYTES	2
Server LAN	504	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
Server LAN	504	collisionsOutPct	Collisions (out) %	Collisions Out %	720	4	Percent	1	%	100.0*DELTA_TIME*DLL_RCV_OFF_FRAMES/(TR_LOST_FRAME-DLL_FRAMES)	327
Server LAN	504	discardedFrames	Discarded Frames	Discarded Frames	57	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server LAN	504	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
Server LAN	504	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
Server LAN	504	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
Server LAN	504	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
Server LAN	504	errors	Errors	Errors	7	2	Frames	0	/sec	TR_FREQUENCY	24
Server LAN	504	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
Server LAN	504	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
Server LAN	504	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	64
Server LAN	504	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
Server LAN	504	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server LAN	504	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	DLL_FRAMES	1
Server LAN	504	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
Server LAN	504	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server LAN	504	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server LAN	504	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server LAN	504	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	DLL_BCASTS	4
Server LAN	504	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
Server LAN	504	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(DLL_BCASTS-DLL_MCASTS)	84
Server LAN	504	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100 0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server LAN	504	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server LAN	504	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Server WAN	600	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server WAN	600	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
Server WAN	600	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
Server WAN	600	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
Server WAN	600	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server WAN	600	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((TR_TOKEN*8*100 0)/$(speedTotal))	79
Server WAN	600	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((DLL_BYTES*8*100 0)/$(speedIn))	78
Server WAN	600	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
Server WAN	600	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
Server WAN	600	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
Server WAN	600	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
Server WAN	600	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
Server WAN	600	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_BYTES	2
Server WAN	600	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
Server WAN	600	discardedFrames	Discarded Frames	Discarded Frames	57	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server WAN	600	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
Server WAN	600	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
Server WAN	600	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
Server WAN	600	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
Server WAN	600	errors	Errors	Errors	7	2	Frames	0	/sec	TR_FREQUENCY	24
Server WAN	600	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
Server WAN	600	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
Server WAN	600	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	64
Server WAN	600	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
Server WAN	600	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
Server WAN	600	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	DLL_FRAMES	1
Server WAN	600	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
Server WAN	600	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server WAN	600	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server WAN	600	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server WAN	600	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	DLL_BCASTS	4
Server WAN	600	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
Server WAN	600	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(DLL_BCASTS-DLL_MCASTS)	84
Server WAN	600	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server WAN	600	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server WAN	600	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Modem	700	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Modem	700	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Modem	700	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	100.0*((DLL_TRANSITS+DLL_ENET_FRAMES)*8.0*DELTA_TIME/DLL_BYTES)/((TR_SET_RECOVERY_MODE+DLL_ALGN_ERRORS)/DELTA_TIME)	124
Modem	700	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	100.0*(DLL_ENET_FRAMES*8.0*DELTA_TIME/DLL_BYTES)/(TR_SET_RECOVERY_MODE/DELTA_TIME)	125
Modem	700	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	100.0*(DLL_TRANSITS*8.0*DELTA_TIME/DLL_BYTES)/(DLL_ALGN_ERRORS/DELTA_TIME)	126
Modem	700	bits	Bits	Bits	437	15	Bits	0	/sec	((DLL_TRANSITS+DLL_ENET_FRAMES)*8 0)	163
Modem	700	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_ENET_FRAMES*8.0)	165
Modem	700	bitsInPerCallSecond	Bits In Per Call Second	Bits In/Call Sec	402	13	Gauge	1		DLL_ENET_FRAMES*8.0*DELTA_TIME/DLL_BYTES	122
Modem	700	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(DLL_TRANSITS*8.0)	168
Modem	700	bitsOutPerCallSecond	Bits Out Per Call Second	Bts Out/Call Sec	403	13	Gauge	1		DLL_TRANSITS*8.0*DELTA_TIME/DLL_BYTES	123
Modem	700	bitsPerCallSecond	Bits Per Call Second	Bits/Call Sec	401	13	Gauge	1		(DLL_TRANSITS+DLL_ENET_FRAMES)*8.0*DELTA_TIME/DLL_BYTES	121
Modem	700	busyTime	Busied Out Time	Busied Out	378	4	Percent	1	%	100.0*TR_FRAME_COPIED	108
Modem	700	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	DLL_TRANSITS+DLL_ENET_FRAMES	31
Modem	700	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_ENET_FRAMES	8
Modem	700	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	DLL_TRANSITS	7
Modem	700	callRcvRate	Speed In	Speed In	324	0	Rate	0	/sec	TR_SET_RECOVERY_MODE	12
Modem	700	callXmitRate	Speed Out	Speed Out	323	0	Rate	0	/sec	DLL_ALGN_ERRORS	11
Modem	700	connectErrors	Connect Errors	Connect Errors	314	0	Rate	0	/sec	DLL_MCASTS	3
Modem	700	connections	Connections	Connections	317	0	Rate	0	/sec	TR_LINE	16
Modem	700	connectTime	Connect Time	Connect Time	320	4	Percent	1	%	100.0*TR_ABORT	105
Modem	700	disabledTime	Disabled Time	Disabled Time	321	4	Percent	1	%	100.0*TR_ADDRESS_COPIED	106
Modem	700	discardedFrames	Frames Discarded	Frames Discarded	26	2	Frames	0	/sec	DLL_COLLISIONS	9
Modem	700	discardedFramesPct	Frames Discarded %	Frames Dscrded %	705	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	301
Modem	700	frameErrors	Frame Errors	Frame Errors	315	2	Frames	0	/sec	DLL_ERRORS	10
Modem	700	frameErrorsPct	Frame Errors %	Frame Errors %	704	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	302
Modem	700	frames	Frames	Frames	1	2	Frames	0	/sec	TR_BIT_STREAMING+TR_CONTENTION_STREAMING	97
Modem	700	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	TR_BIT_STREAMING	14
Modem	700	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Modem	700	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Modem	700	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Modem	700	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Modem	700	modemBusyTime	Modem Busy Time	Modem Busy Time	395	4	Percent	1	%	100.0*(TR_INTERNAL+TR_ABORT+TR_ADDRESS_COPIED+TR_CONGESTION+TR_FRAME_COPIED+TR_LLC_FRAMES)	118
Modem	700	modemErrors	Modem Errors	Modem Errors	351	0	Rate	0	/sec	DLL_MCASTS+DLL_XMT_OFF_FRAMES	102
Modem	700	offhookTime	Off Hook Time	Off Hook Time	319	4	Percent	1	%	100.0*TR_INTERNAL	104
Modem	700	onhookTime	On Hook Time	On Hook Time	318	4	Percent	1	%	100 0*TR_BURST	103
Modem	700	otherErrors	Other Errors	Other Errors	352	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Modem	700	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Modem	700	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Modem	700	retrains	Retrains	Retrains	316	12	Per Call Minute	1	(/Call Min)	TR_SIGNAL_LOSS*60.0*DELTA_TIME/DLL_BYTES	101
Modem	700	testTime	Test Time	Test Time	379	4	Percent	1	%	100 0*TR_LLC_FRAMES	109
Modem	700	unknownTime	Unknown Time	Unknown Time	322	4	Percent	1	%	100.0*TR_CONGESTION	107
ISDN Interface	701	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
ISDN Interface	701	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
ISDN Interface	701	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	100.0*((DLL_TRANSITS+DLL_ENET_FRAMES)*8.0*DELTA_TIME/DLL_BYTES)/((TR_SET_RECOVERY_MODE+DLL_ALGN_ERRORS)/DELTA_TIME)	124
ISDN Interface	701	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	100.0*(DLL_ENET_FRAMES*8.0*DELTA_TIME/DLL_BYTES)/(TR_SET_RECOVERY_MODE/DELTA_TIME)	125
ISDN Interface	701	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	100.0*(DLL_TRANSITS*8.0*DELTA_TIME/DLL_BYTES)/(DLL_ALGN_ERRORS/DELTA_TIME)	126
ISDN Interface	701	bits	Bits	Bits	437	15	Bits	0	/sec	((DLL_TRANSITS+DLL_ENET_FRAMES)*8.0)	163
ISDN Interface	701	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_ENET_FRAMES*8.0)	165
ISDN Interface	701	bitsInPerCallSecond	Bits In Per Call Second	Bits In/Call Sec	402	13	Gauge	1		DLL_ENET_FRAMES*8.0*DELTA_TIME/DLL_BYTES	122
ISDN Interface	701	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(DLL_TRANSITS*8.0)	168
ISDN Interface	701	bitsOutPerCallSecond	Bits Out Per Call Second	Bts Out/Call Sec	403	13	Gauge	1		DLL_TRANSITS*8.0*DELTA_TIME/DLL_BYTES	123
ISDN Interface	701	bitsPerCallSecond	Bits Per Call Second	Bits/Call Sec	401	13	Gauge	1		(DLL_TRANSITS+DLL_ENET_FRAMES)*8.0*DELTA_TIME/DLL_BYTES	121
ISDN Interface	701	busyTime	Busied Out Time	Busied Out	378	4	Percent	1	%	100.0*TR_FRAME_COPIED	108
ISDN Interface	701	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	DLL_TRANSITS+DLL_ENET_FRAMES	31
ISDN Interface	701	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_ENET_FRAMES	8
ISDN Interface	701	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	DLL_TRANSITS	7
ISDN Interface	701	callRcvRate	Speed In	Speed In	324	0	Rate	0	/sec	TR_SET_RECOVERY_MODE	12
ISDN Interface	701	callXmitRate	Speed Out	Speed Out	323	0	Rate	0	/sec	DLL_ALGN_ERRORS	11
ISDN Interface	701	connectErrors	Connect Errors	Connect Errors	314	0	Rate	0	/sec	DLL_MCASTS	3
ISDN Interface	701	connections	Connections	Connections	317	0	Rate	0	/sec	TR_LINE	16
ISDN Interface	701	connectTime	Connect Time	Connect Time	320	4	Percent	1	%	100.0*TR_ABORT	105
ISDN Interface	701	disabledTime	Disabled Time	Disabled Time	321	4	Percent	1	%	100.0*TR_ADDRESS_COPIED	106
ISDN Interface	701	discardedFrames	Frames Discarded	Frames Discarded	26	2	Frames	0	/sec	DLL_COLLISIONS	9
ISDN Interface	701	discardedFramesPct	Frames Discarded %	Frames Dscrded %	705	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	301
ISDN Interface	701	frameErrors	Frame Errors	Frame Errors	315	2	Frames	0	/sec	DLL_ERRORS	10
ISDN Interface	701	frameErrorsPct	Frame Errors %	Frame Errors %	704	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	302
ISDN Interface	701	frames	Frames	Frames	1	2	Frames	0	/sec	TR_BIT_STREAMING+TR_CONTENTION_STREAMING	97
ISDN Interface	701	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	TR_BIT_STREAMING	14
ISDN Interface	701	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
ISDN Interface	701	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
ISDN Interface	701	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
ISDN Interface	701	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
ISDN Interface	701	modemBusyTime	Modem Busy Time	Modem Busy Time	395	4	Percent	1	%	100.0*(TR_INTERNAL+TR_ABORT+TR_ADDRESS_COPIED+TR_CONGESTION+TR_FRAME_COPIED+TR_LLC_FRAMES)	118
ISDN Interface	701	modemErrors	Modem Errors	Modem Errors	351	0	Rate	0	/sec	DLL_MCASTS+DLL_XMT_OFF_FRAMES	102
ISDN Interface	701	offhookTime	Off Hook Time	Off Hook Time	319	4	Percent	1	%	100.0*TR_INTERNAL	104
ISDN Interface	701	onhookTime	On Hook Time	On Hook Time	318	4	Percent	1	%	100.0*TR_BURST	103
ISDN Interface	701	otherErrors	Other Errors	Other Errors	352	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
ISDN Interface	701	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
ISDN Interface	701	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
ISDN Interface	701	testTime	Test Time	Test Time	379	4	Percent	1	%	100.0*TR_LLC_FRAMES	109
ISDN Interface	701	unknownTime	Unknown Time	Unknown Time	322	4	Percent	1	%	100.0*TR_CONGESTION	107
Remote Access Server	725	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Remote Access Server	725	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Remote Access Server	725	bits	Bits	Bits	437	15	Bits	0	/sec	((DLL_TRANSITS+DLL_ENET_FRAMES)*8.0)	163
Remote Access Server	725	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_ENET_FRAMES*8.0)	165
Remote Access Server	725	bitsInPerCallSecond	Bits In Per Call Second	Bits In/Call Sec	402	13	Gauge	1		DLL_ENET_FRAMES*8.0*DELTA_TIME/DLL_BYTES	122
Remote Access Server	725	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(DLL_TRANSITS*8.0)	168
Remote Access Server	725	bitsOutPerCallSecond	Bits Out Per Call Second	Bts Out/Call Sec	403	13	Gauge	1		DLL_TRANSITS*8.0*DELTA_TIME/DLL_BYTES	123

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Remote Access Server	725	bitsPerCallSecond	Bits Per Call Second	Bits/Call Sec	401	13	Gauge	1		(DLL_TRANSITS+DLL_ENET_FRAMES)*8.0*DELTA_TIME/DLL_BYTES	121
Remote Access Server	725	busyTime	RAS Busied Out Time	RAS Busied Out	393	4	Percent	1	%	100.0*TR_FRAME_COPIED*DELTA_TIME/TR_LOST_FRAME	115
Remote Access Server	725	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	DLL_TRANSITS+DLL_ENET_FRAMES	31
Remote Access Server	725	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_ENET_FRAMES	8
Remote Access Server	725	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	DLL_TRANSITS	7
Remote Access Server	725	connectErrors	Connect Errors	Connect Errors	314	0	Rate	0	/sec	DLL_MCASTS	3
Remote Access Server	725	connections	Connections	Connections	317	0	Rate	0	/sec	TR_LINE	16
Remote Access Server	725	connectTime	RAS Connect Time	RAS Connect Time	390	4	Percent	1	%	100.0*TR_ABORT*DELTA_TIME/TR_LOST_FRAME	112
Remote Access Server	725	cpuUtilization	CPU Utilization	CPU Utilization	91	4	Percent	1	%	DLL_BCASTS	4
Remote Access Server	725	disabledTime	RAS Disabled Time	RAS Dsbld Time	391	4	Percent	1	%	100.0*TR_ADDRESS_COPIED*DELTA_TIME/TR_LOST_FRAME	113
Remote Access Server	725	discardedFrames	Frames Discarded	Frames Discarded	26	2	Frames	0	/sec	DLL_COLLISIONS	9
Remote Access Server	725	discardedFramesPct	Frames Discarded %	Frames Dscrded %	705	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	301
Remote Access Server	725	frameErrors	Frame Errors	Frame Errors	315	2	Frames	0	/sec	DLL_ERRORS	10
Remote Access Server	725	frameErrorsPct	Frame Errors %	Frame Errors %	704	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	302
Remote Access Server	725	frames	Frames	Frames	1	2	Frames	0	/sec	TR_BIT_STREAMING+TR_CONTENTION_STREAMING	97
Remote Access Server	725	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	TR_BIT_STREAMING	14
Remote Access Server	725	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Remote Access Server	725	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Remote Access Server	725	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Remote Access Server	725	memory	Memory	Memory	376	7	Bytes	4	(bytes)	TR_SET_RECOVERY_MODE	12
Remote Access Server	725	memoryFree	Memory Free	Memory Free	706	7	Bytes	4	(bytes)	TR_SET_RECOVERY_MODE-DLL_ALGN_ERRORS	304
Remote Access Server	725	memoryUsed	Memory Used	Memory Used	375	7	Bytes	4	(bytes)	DLL_ALGN_ERRORS	11
Remote Access Server	725	memoryUtilization	Memory Utilization	Memory Util	168	4	Percent	1	%	100.0*DELTA_TIME*DLL_ALGN_ERRORS/TR_SET_RECOVERY_MODE	99
Remote Access Server	725	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Remote Access Server	725	modemBusyTime	Modem Busy Time	Modem Busy Time	395	4	Percent	1	%	100.0*(TR_INTERNAL+TR_ABORT+TR_ADDRESS_COPIED+TR_CONGESTION+TR_FRAME_COPIED+TR_LLC_FRAMES)*DELTA_TIME/TR_LOST_FRAME	117
Remote Access Server	725	modemErrors	Modem Errors	Modem Errors	351	0	Rate	0	/sec	DLL_MCASTS+DLL_XMT_OFF_FRAMES	102
Remote Access Server	725	modems	Number of Modems	Nmbr of Modems	396	19	Size	4		TR_FREQUENCY	24
Remote Access Server	725	modemsBusy	Modems Busy	Modems Busy	397	19	Size	4		TR_TOKEN	23
Remote Access Server	725	modemsBusyPct	Percent Modems Busy	Pct Modems Busy	377	4	Percent	1	%	100.0*DELTA_TIME*TR_TOKEN/TR_FREQUENCY	98
Remote Access Server	725	offhookTime	RAS Off Hook Time	RAS Off Hk Time	389	4	Percent	1	%	100.0*TR_INTERNAL*DELTA_TIME/TR_LOST_FRAME	111
Remote Access Server	725	onhookTime	RAS On Hook Time	RAS On Hk Time	388	4	Percent	1	%	100.0*TR_BURST*DELTA_TIME/TR_LOST_FRAME	110
Remote Access Server	725	otherErrors	Other Errors	Other Errors	352	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Remote Access Server	725	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Remote Access Server	725	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Remote Access Server	725	retrains	Retrains	Retrains	316	12	Per Call Minute	1	(/Call Min)	TR_SIGNAL_LOSS*60.0*DELTA_TIME/DLL_BYTES	101
Remote Access Server	725	testTime	RAS Test Time	RAS Test Time	394	4	Percent	1	%	100.0*TR_LLC_FRAMES*DELTA_TIME/TR_LOST_FRAME	116
Remote Access Server	725	unknownTime	RAS Unknown Time	RAS Unknown Time	392	4	Percent	1	%	100.0*TR_CONGESTION*DELTA_TIME/TR_LOST_FRAME	114
RAS CPU	750	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
RAS CPU	750	cpuUtilization	CPU Utilization	CPU Utilization	91	4	Percent	1	%	DLL_BCASTS	4
RAS CPU	750	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
RAS CPU	750	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
RAS CPU	750	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Modem Pool	775	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Modem Pool	775	bits	Bits	Bits	437	15	Bits	0	/sec	((DLL_TRANSITS+DLL_ENET_FRAMES)*8.0)	163
Modem Pool	775	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_ENET_FRAMES*8.0)	165
Modem Pool	775	bitsInPerCallSecond	Bits In Per Call Second	Bits In/Call Sec	402	13	Gauge	1		DLL_ENET_FRAMES*8.0*DELTA_TIME/DLL_BYTES	122
Modem Pool	775	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(DLL_TRANSITS*8.0)	168
Modem Pool	775	bitsOutPerCallSecond	Bits Out Per Call Second	Bits Out/Call Sec	403	13	Gauge	1		DLL_TRANSITS*8.0*DELTA_TIME/DLL_BYTES	123
Modem Pool	775	bitsPerCallSecond	Bits Per Call Second	Bits/Call Sec	401	13	Gauge	1		(DLL_TRANSITS+DLL_ENET_FRAMES)*8.0*DELTA_TIME/DLL_BYTES	121
Modem Pool	775	busyTime	Pool Busied Out Time	Pool Busied Out	386	4	Percent	1	%	100.0*TR_FRAME_COPIED*DELTA_TIME/TR_LOST_FRAME	115
Modem Pool	775	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	DLL_TRANSITS+DLL_ENET_FRAMES	31
Modem Pool	775	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_ENET_FRAMES	8
Modem Pool	775	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	DLL_TRANSITS	7
Modem Pool	775	connectErrors	Connect Errors	Connect Errors	314	0	Rate	0	/sec	DLL_MCASTS	3
Modem Pool	775	connections	Connections	Connections	317	0	Rate	0	/sec	TR_LINE	16
Modem Pool	775	connectTime	Pool Connect Time	Pool Conn Time	383	4	Percent	1	%	100.0*TR_ABORT*DELTA_TIME/TR_LOST_FRAME	112
Modem Pool	775	disabledTime	Pool Disabled Time	Pool Dsbld Time	384	4	Percent	1	%	100.0*TR_ADDRESS_COPIED*DELTA_TIME/TR_LOST_FRAME	113
Modem Pool	775	discardedFrames	Frames Discarded	Frames Discarded	26	2	Frames	0	/sec	DLL_COLLISIONS	9
Modem Pool	775	discardedFramesPct	Frames Discarded %	Frames Dscrded %	705	4	Percent	1	%	100 0*DELTA_TIME*DLL_COLLISIONS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	301
Modem Pool	775	frameErrors	Frame Errors	Frame Errors	315	2	Frames	0	/sec	DLL_ERRORS	10
Modem Pool	775	frameErrorsPct	Frame Errors %	Frame Errors %	704	4	Percent	1	%	100 0*DELTA_TIME*DLL_ERRORS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	302
Modem Pool	775	frames	Frames	Frames	1	2	Frames	0	/sec	TR_BIT_STREAMING+TR_CONTENTION_STREAMING	97
Modem Pool	775	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	TR_BIT_STREAMING	14
Modem Pool	775	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Modem Pool	775	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Modem Pool	775	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Modem Pool	775	modemBusyTime	Modem Busy Time	Modem Busy Time	395	4	Percent	1	%	100.0*(TR_INTERNAL+TR_ABORT+TR_ADDRESS_COPIED+TR_CONGESTION+TR_FRAME_COPIED+TR_LLC_FRAMES)*DELTA_TIME/TR_LOST_FRAME	117
Modem Pool	775	modemErrors	Modem Errors	Modem Errors	351	0	Rate	0	/sec	DLL_MCASTS+DLL_XMT_OFF_FRAMES	102
Modem Pool	775	modems	Number of Modems	Nmbr of Modems	396	19	Size	4		TR_FREQUENCY	24
Modem Pool	775	modemsBusy	Modems Busy	Modems Busy	397	19	Size	4		TR_TOKEN	23
Modem Pool	775	modemsBusyPct	Percent Modems Busy	Pct Modems Busy	377	4	Percent	1	%	100.0*DELTA_TIME*TR_TOKEN/TR_FREQUENCY	98
Modem Pool	775	offhookTime	Pool Off Hook Time	Pool Off Hk Time	382	4	Percent	1	%	100.0*TR_INTERNAL*DELTA_TIME/TR_LOST_FRAME	111
Modem Pool	775	onhookTime	Pool On Hook Time	Pool On Hk Time	381	4	Percent	1	%	100.0*TR_BURST*DELTA_TIME/TR_LOST_FRAME	110
Modem Pool	775	otherErrors	Other Errors	Other Errors	352	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Modem Pool	775	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Modem Pool	775	retrains	Retrains	Retrains	316	12	Per Call Minute	1	(/Call Min)	TR_SIGNAL_LOSS*60 0*DELTA_TIME/DLL_BYTES	101
Modem Pool	775	testTime	Pool Test Time	Pool Test Time	387	4	Percent	1	%	100.0*TR_LLC_FRAMES*DELTA_TIME/TR_LOST_FRAME	116
Modem Pool	775	unknownTime	Pool Unknown Time	Pool Unk Time	385	4	Percent	1	%	100.0*TR_CONGESTION*DELTA_TIME/TR_LOST_FRAME	114
Response Path	800	attempts	Attempts	Attempts	467	13	Gauge	1		(DLL_BCASTS)	173
Response Path	800	availability	Service Availability	Service Avail	498	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Response Path	800	avgRespTime	Avg. Response Time	Avg Resp Time	440	11	Milliseconds	1	(msec)	((LATENCY/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	172
Response Path	800	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Response Path	800	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_TRANSITS	7
Response Path	800	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(DLL_XMT_OFF_FRAMES-DLL_TRANSITS)	182
Response Path	800	failedAttempts	Failed Attempts	Failed Attempts	469	4	Percent	1	%	(100*((DLL_BCASTS - DLL_RCV_OFF_FRAMES)/DLL_BCASTS)*DELTA_TIME)	175
Response Path	800	goal	Limit	Limit	474	11	Milliseconds	1	(msec)	($(speed)*DELTA_TIME)	184
Response Path	800	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Response Path	800	maxResponse	Maximum Response	Max Response	443	17	Max Milliseconds	3	(msec)	DLL_BYTES	2
Response Path	800	minResponse	Minimum Response	Min Response	442	16	Min Milliseconds	2	(msec)	DLL_FRAMES	1
Response Path	800	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Response Path	800	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Response Path	800	responseVsGoal	Response/Limit	Response/Limit	453	4	Percent	1	%	(100*(LATENCY/($(speed)*DLL_RCV_OFF_FRAMES))*DELTA_TIME)	185
Response Path	800	successfulAttempts	Successful Attempts	Successful Att	468	4	Percent	1	%	(100*(DLL_RCV_OFF_FRAMES/DLL_BCASTS)*DELTA_TIME)	174
Response Path w/ Jitter	801	attempts	Attempts	Attempts	467	13	Gauge	1		(DLL_BCASTS)	173
Response Path w/ Jitter	801	availability	Service Availability	Service Avail	498	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Response Path w/ Jitter	801	avgRespTime	Avg. Response Time	Avg Resp Time	440	11	Milliseconds	1	(msec)	((LATENCY/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	172
Response Path w/ Jitter	801	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Response Path w/ Jitter	801	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_TRANSITS	7
Response Path w/ Jitter	801	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(DLL_XMT_OFF_FRAMES-DLL_TRANSITS)	182
Response Path w/ Jitter	801	failedAttempts	Failed Attempts	Failed Attempts	469	4	Percent	1	%	(100*((DLL_BCASTS - DLL_RCV_OFF_FRAMES)/DLL_BCASTS)*DELTA_TIME)	175
Response Path w/ Jitter	801	goal	Limit	Limit	474	11	Milliseconds	1	(msec)	($(speed)*DELTA_TIME)	184
Response Path w/ Jitter	801	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Response Path w/ Jitter	801	jitter	Jitter	Jitter	455	11	Milliseconds	1	(msec)	((DLL_ERRORS+DLL_ENET_FRAMES)*DELTA_TIME/(TR_ADDRESS_COPIED+TR_TOKEN))	188
Response Path w/ Jitter	801	jitterIn	Jitter In	Jitter In	476	11	Milliseconds	1	(msec)	(DLL_ERRORS*DELTA_TIME/TR_TOKEN)	187
Response Path w/ Jitter	801	jitterOut	Jitter Out	Jitter Out	475	11	Milliseconds	1	(msec)	(DLL_ENET_FRAMES*DELTA_TIME/TR_ADDRESS_COPIED)	186
Response Path w/ Jitter	801	maxResponse	Maximum Response	Max Response	443	17	Max Milliseconds	3	(msec)	DLL_BYTES	2
Response Path w/ Jitter	801	minResponse	Minimum Response	Min Response	442	16	Min Milliseconds	2	(msec)	DLL_FRAMES	1
Response Path w/ Jitter	801	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Response Path w/ Jitter	801	negativeJitter	Negative Jitter	Negative Jitter	478	11	Milliseconds	1	(msec)	((DLL_COLLISIONS+DLL_ALGN_ERRORS)*DELTA_TIME/(TR_ADDRESS_COPIED+TR_TOKEN))	190
Response Path w/ Jitter	801	positiveJitter	Positive Jitter	Positive Jitter	477	11	Milliseconds	1	(msec)	(((DLL_ERRORS-DLL_ALGN_ERRORS)+(DLL_ENET_FRAMES-DLL_COLLISIONS))*DELTA_TIME/(TR_ADDRESS_COPIED+TR_TOKEN))	189
Response Path w/ Jitter	801	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Response Path w/ Jitter	801	responseVsGoal	Response/Limit	Response/Limit	453	4	Percent	1	%	(100*(LATENCY/($(speed)*DLL_RCV_OFF_FRAMES))*DELTA_TIME)	185
Response Path w/ Jitter	801	successfulAttempts	Successful Attempts	Successful Att	468	4	Percent	1	%	(100*(DLL_RCV_OFF_FRAMES/DLL_BCASTS)*DELTA_TIME)	174
Application Response Path	802	attempts	Attempts	Attempts	467	13	Gauge	1		(DLL_BCASTS)	173
Application Response Path	802	availability	Service Availability	Service Avail	498	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Application Response Path	802	avgRespTime	Avg. Response Time	Avg Resp Time	440	11	Milliseconds	1	(msec)	((LATENCY/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	172
Application Response Path	802	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Application Response Path	802	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_TRANSITS	7
Application Response Path	802	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(DLL_XMT_OFF_FRAMES-DLL_TRANSITS)	182
Application Response Path	802	failedAttempts	Failed Attempts	Failed Attempts	469	4	Percent	1	%	(100*((DLL_BCASTS - DLL_RCV_OFF_FRAMES)/DLL_BCASTS)*DELTA_TIME)	175
Application Response Path	802	goal	Limit	Limit	474	11	Milliseconds	1	(msec)	($(speed)*DELTA_TIME)	184
Application Response Path	802	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Application Response Path	802	maxResponse	Maximum Response	Max Response	443	17	Max Milliseconds	3	(msec)	DLL_BYTES	2
Application Response Path	802	minResponse	Minimum Response	Min Response	442	16	Min Milliseconds	2	(msec)	DLL_FRAMES	1
Application Response Path	802	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Application Response Path	802	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Application Response Path	802	responseVsGoal	Response/Limit	Response/Limit	453	4	Percent	1	%	(100*(LATENCY/($(speed)*DLL_RCV_OFF_FRAMES))*DELTA_TIME)	185
Application Response Path	802	successfulAttempts	Successful Attempts	Successful Att	468	4	Percent	1	%	(100*(DLL_RCV_OFF_FRAMES/DLL_BCASTS)*DELTA_TIME)	174
FirstSense Response Path	803	attempts	Attempts	Attempts	467	13	Gauge	1		(DLL_BCASTS)	173
FirstSense Response Path	803	availability	Service Availability	Service Avail	498	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
FirstSense Response Path	803	avgClientResponse	Avg. Client Response	Avg Client Resp	592	11	Milliseconds	1	(msec)	(TR_INTERNAL/DLL_RCV_OFF_FRAMES)*DELTA_TIME	210
FirstSense Response Path	803	avgNetworkResponse	Avg. Network Response	Avg Network Resp	594	11	Milliseconds	1	(msec)	((LATENCY-TR_INTERNAL-TR_ABORT)/DLL_RCV_OFF_FRAMES)*DELTA_TIME	212
FirstSense Response Path	803	avgRespTime	Avg. Response Time	Avg Resp Time	440	11	Milliseconds	1	(msec)	((LATENCY/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	172
FirstSense Response Path	803	avgServerResponse	Avg. Server Response	Avg Server Resp	593	11	Milliseconds	1	(msec)	(TR_ABORT/DLL_RCV_OFF_FRAMES)*DELTA_TIME	211
FirstSense Response Path	803	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
FirstSense Response Path	803	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_TRANSITS	7
FirstSense Response Path	803	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(DLL_XMT_OFF_FRAMES-DLL_TRANSITS)	182
FirstSense Response Path	803	failedAttempts	Failed Attempts	Failed Attempts	469	4	Percent	1	%	(100*((DLL_BCASTS - DLL_RCV_OFF_FRAMES)/DLL_BCASTS)*DELTA_TIME)	175
FirstSense Response Path	803	goal	Limit	Limit	474	11	Milliseconds	1	(msec)	($(speed)*DELTA_TIME)	184
FirstSense Response Path	803	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
FirstSense Response Path	803	maxResponse	Maximum Response	Max Response	443	17	Max Milliseconds	3	(msec)	DLL_BYTES	2
FirstSense Response Path	803	minResponse	Minimum Response	Min Response	442	16	Min Milliseconds	2	(msec)	DLL_FRAMES	1
FirstSense Response Path	803	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
FirstSense Response Path	803	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
FirstSense Response Path	803	responseVsGoal	Response/Limit	Response/Limit	453	4	Percent	1	%	(100*(LATENCY/($(speed)*DLL_RCV_OFF_FRAMES))*DELTA_TIME)	185
FirstSense Response Path	803	successfulAttempts	Successful Attempts	Successful Att	468	4	Percent	1	%	(100*(DLL_RCV_OFF_FRAMES/DLL_BCASTS)*DELTA_TIME)	174
FirstSense Response Path	803	tcpConnectFailures	TCP Connect Failures	TCP Failures	543	4	Percent	1	%	(100*((DLL_COLLISIONS - DLL_ERRORS)/DLL_COLLISIONS)*DELTA_TIME)	203
FirstSense Response Path	803	tcpConnectSuccesses	TCP Connect Successes	TCP Successes	542	4	Percent	1	%	(100*(DLL_ERRORS/DLL_COLLISIONS)*DELTA_TIME)	202
FirstSense Response Path	803	tcpConnectTime	TCP Connect Time (msec)	TCP Connect Time	541	11	Milliseconds	1	(msec)	((DLL_ENET_FRAMES/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	200
FirstSense Response Path	803	thresholdViolations	Threshold Violations	Thld Violations	719	13	Gauge	1		TR_BURST	17
FirstSense Response Path	803	transactions	Transactions	Transactions	441	18	Transactions	1	/min	(DLL_RCV_OFF_FRAMES*60)	201
Empire Service Response Path	805	attempts	Attempts	Attempts	467	13	Gauge	1		(DLL_BCASTS)	173
Empire Service Response Path	805	availability	Service Availability	Service Avail	498	10	Total Time	1	(%)	(AVAILABLE_TIME*100 0)	77
Empire Service Response Path	805	avgRespTime	Avg. Response Time	Avg Resp Time	440	11	Milliseconds	1	(msec)	((LATENCY/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	172
Empire Service Response Path	805	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Empire Service Response Path	805	dnsLookupTimeAvg	Avg. DNS Lookup Time (msec)	Avg DNS Time	608	11	Milliseconds	1	(msec)	((TR_SIGNAL_LOSS/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	223
Empire Service Response Path	805	dnsLookupTimeMax	Max. DNS Lookup Time (msec)	Max DNS Time	610	17	Max Milliseconds	3	(msec)	TR_CONTENTION_STREAMING	15
Empire Service Response Path	805	dnsLookupTimeMin	Min. DNS Lookup Time (msec)	Min DNS Time	609	16	Min Milliseconds	2	(msec)	TR_BIT_STREAMING	14
Empire Service Response Path	805	failedAttempts	Failed Attempts	Failed Attempts	469	4	Percent	1	%	(100*((DLL_BCASTS - DLL_RCV_OFF_FRAMES)/DLL_BCASTS)*DELTA_TIME)	175
Empire Service Response Path	805	goal	Limit	Limit	474	11	Milliseconds	1	(msec)	($(speed)*DELTA_TIME)	184
Empire Service Response Path	805	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Empire Service Response Path	805	maxResponse	Maximum Response	Max Response	443	17	Max Milliseconds	3	(msec)	DLL_BYTES	2
Empire Service Response Path	805	minResponse	Minimum Response	Min Response	442	16	Min Milliseconds	2	(msec)	DLL_FRAMES	1
Empire Service Response Path	805	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Empire Service Response Path	805	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Empire Service Response Path	805	responseVsGoal	Response/Limit	Response/Limit	453	4	Percent	1	%	(100*(LATENCY/($(speed)*DLL_RCV_OFF_FRAMES))*DELTA_TIME)	185
Empire Service Response Path	805	successfulAttempts	Successful Attempts	Successful Att	468	4	Percent	1	%	(100*(DLL_RCV_OFF_FRAMES/DLL_BCASTS)*DELTA_TIME)	174
Empire Service Response Path	805	tcpConnectTimeAvg	Avg. TCP Connect Time (msec)	Avg TCP Con Time	605	11	Milliseconds	1	(msec)	((DLL_ENET_FRAMES/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	222
Empire Service Response Path	805	tcpConnectTimeMax	Max. TCP Connect Time (msec)	Max TCP Con Time	607	17	Max Milliseconds	3	(msec)	TR_SET_RECOVERY_MODE	12
Empire Service Response Path	805	tcpConnectTimeMin	Min. TCP Connect Time (msec)	Min TCP Con Time	606	16	Min Milliseconds	2	(msec)	DLL_ALGN_ERRORS	11
Empire Service Response Path	805	transactions	Transactions	Transactions	441	18	Transactions	1	/min	(DLL_RCV_OFF_FRAMES*60)	201
Empire Service Response Path	805	transactionTimeAvg	Avg. Transaction Time (msec)	Avg Trans Time	611	11	Milliseconds	1	(msec)	((TR_ADDRESS_COPIED/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	224
Empire Service Response Path	805	transactionTimeMax	Max. Transaction Time (msec)	Max Trans Time	613	17	Max Milliseconds	3	(msec)	TR_LOST_FRAME	22
Empire Service Response Path	805	transactionTimeMin	Min. Transaction Time (msec)	Min Trans Time	612	16	Min Milliseconds	2	(msec)	TR_CONGESTION	21
System Partition	3000	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
System Partition	3000	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
System Partition	3000	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
System Partition	3000	inodeUtilization	Inode Utilization	Inode Util	581	4	Percent	1	%	DLL_FRAMES	1
System Partition	3000	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
System Partition	3000	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
System Partition	3000	partitionAllocationFailures	Partition Allocation Failures	Part Alloc Fails	157	5	Per Second	1		PACKETS_IN	27
System Partition	3000	partitionReads	Partition Reads	Part Reads	154	0	Rate	0	/sec	BYTES_IN	28
System Partition	3000	PartitionReadsWrites	Partition Reads&Writes	Part Reads&Wrts	156	0	Rate	0	/sec	BYTES_OUT	30
System Partition	3000	partitionStorageCapacity	Partition Storage Capacity	Part Stor Cap	152	7	Bytes	4	(bytes)	TR_FREQUENCY	24
System Partition	3000	partitionStorageFree	Partition Storage Free	Part Stor Free	601	7	Bytes	4	(bytes)	(TR_FREQUENCY-TR_FRAME_COPIED)	218
System Partition	3000	partitionStorageUsed	Partition Storage Used	Part Stor Used	151	7	Bytes	4	(bytes)	TR_FRAME_COPIED	25
System Partition	3000	partitionUtilization	Partition Utilization	Part Util	153	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	62
System Partition	3000	partitionWrites	Partition Writes	Part Writes	155	0	Rate	0	/sec	PACKETS_OUT	29
System Partition	3000	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
System Partition	3000	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
BMC NT System Partition	3001	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
BMC NT System Partition	3001	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
BMC NT System Partition	3001	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
BMC NT System Partition	3001	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
BMC NT System Partition	3001	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
BMC NT System Partition	3001	partitionStorageCapacity	Partition Storage Capacity	Part Stor Cap	152	7	Bytes	4	(bytes)	TR_FREQUENCY	24
BMC NT System Partition	3001	partitionStorageUsed	Partition Storage Used	Part Stor Used	151	7	Bytes	4	(bytes)	TR_FRAME_COPIED	25
BMC NT System Partition	3001	partitionUtilization	Partition Utilization	Part Util	153	4	Percent	1	%	100 0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	62
BMC NT System Partition	3001	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
BMC NT System Partition	3001	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
BMC UNIX System Partition	3002	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
BMC UNIX System Partition	3002	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
BMC UNIX System Partition	3002	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
BMC UNIX System Partition	3002	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
BMC UNIX System Partition	3002	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
BMC UNIX System Partition	3002	partitionStorageCapacity	Partition Storage Capacity	Part Stor Cap	152	7	Bytes	4	(bytes)	TR_FREQUENCY	24
BMC UNIX System Partition	3002	partitionStorageUsed	Partition Storage Used	Part Stor Used	151	7	Bytes	4	(bytes)	TR_FRAME_COPIED	25
BMC UNIX System Partition	3002	partitionUtilization	Partition Utilization	Part Util	153	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	62
BMC UNIX System Partition	3002	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
BMC UNIX System Partition	3002	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
UNIX Process Set	3100	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
UNIX Process Set	3100	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
UNIX Process Set	3100	cpuUtilization	CPU Utilization	CPU Utilization	596	4	Percent	1	%	DLL_BYTES	2
UNIX Process Set	3100	diskBlockReads	Disk Block Reads	Disk Blk Reads	586	0	Rate	0	/sec	DLL_TRANSITS	7
UNIX Process Set	3100	diskBlockWrites	Disk Block Writes	Disk Blk Writes	587	0	Rate	0	/sec	DLL_ENET_FRAMES	8
UNIX Process Set	3100	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
UNIX Process Set	3100	hardPageFaults	Hard Page Faults	Hard Page Faults	565	0	Rate	0	/sec	TR_SIGNAL_LOSS	13
UNIX Process Set	3100	hardPageFaultsPct	Hard Page Faults %	Hard Pg Faults %	573	4	Percent	1	%	100.0*DELTA_TIME*(TR_SIGNAL_LOSS/(TR_SIGNAL_LOSS+TR_BIT_STREAMING))	213
UNIX Process Set	3100	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
UNIX Process Set	3100	networkMessages	Network Messages	Network Msgs	707	0	Rate	0	/sec	DLL_COLLISIONS+DLL_ERRORS	312
UNIX Process Set	3100	networkMessagesIn	Network Messages In	Net Msgs In	588	0	Rate	0	/sec	DLL_COLLISIONS	9
UNIX Process Set	3100	networkMessagesOut	Network Messages Out	Net Msgs Out	589	0	Rate	0	/sec	DLL_ERRORS	10
UNIX Process Set	3100	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_MCASTS	3
UNIX Process Set	3100	softPageFaults	Soft Page Faults	Soft Page Faults	564	0	Rate	0	/sec	TR_BIT_STREAMING	14
UNIX Process Set	3100	swaps	Swaps	Swaps	566	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
UNIX Process Set	3100	systemCalls	System Calls	System Calls	562	0	Rate	0	/sec	DLL_ALGN_ERRORS	11
UNIX Process Set	3100	threads	Threads	Threads	563	19	Size	4		TR_SET_RECOVERY_MODE	12
UNIX Process Set	3100	totalPageFaults	Total Page Faults	Total Pg Faults	575	0	Rate	0	/sec	(TR_SIGNAL_LOSS+TR_BIT_STREAMING)	215
UNIX Process Set	3100	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes	4	(bytes)	DLL_BCASTS	4
NT Process Set	3101	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
NT Process Set	3101	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
NT Process Set	3101	cpuUtilization	CPU Utilization	CPU Utilization	596	4	Percent	1	%	DLL_BYTES	2
NT Process Set	3101	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
NT Process Set	3101	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
NT Process Set	3101	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_MCASTS	3
NT Process Set	3101	threads	Threads	Threads	563	19	Size	4		TR_SET_RECOVERY_MODE	12
NT Process Set	3101	totalPageFaults	Total Page Faults	Total Pg Faults	575	0	Rate	0	/sec	(TR_SIGNAL_LOSS+TR_BIT_STREAMING)	215
UNIX Process Set Excluded	3200	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
UNIX Process Set Excluded	3200	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
UNIX Process Set Excluded	3200	cpuUtilization	CPU Utilization	CPU Utilization	596	4	Percent	1	%	DLL_BYTES	2
UNIX Process Set Excluded	3200	diskBlockReads	Disk Block Reads	Disk Blk Reads	586	0	Rate	0	/sec	DLL_TRANSITS	7
UNIX Process Set Excluded	3200	diskBlockWrites	Disk Block Writes	Disk Blk Writes	587	0	Rate	0	/sec	DLL_ENET_FRAMES	8
UNIX Process Set Excluded	3200	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
UNIX Process Set Excluded	3200	hardPageFaults	Hard Page Faults	Hard Page Faults	565	0	Rate	0	/sec	TR_SIGNAL_LOSS	13
UNIX Process Set Excluded	3200	hardPageFaultsPct	Hard Page Faults %	Hard Pg Faults %	573	4	Percent	1	%	100.0*DELTA_TIME*(TR_SIGNAL_LOSS/(TR_SIGNAL_LOSS+TR_BIT_STREAMING))	213
UNIX Process Set Excluded	3200	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
UNIX Process Set Excluded	3200	networkMessagesIn	Network Messages In	Net Msgs In	588	0	Rate	0	/sec	DLL_COLLISIONS	9
UNIX Process Set Excluded	3200	networkMessagesOut	Network Messages Out	Net Msgs Out	589	0	Rate	0	/sec	DLL_ERRORS	10
UNIX Process Set Excluded	3200	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_MCASTS	3
UNIX Process Set Excluded	3200	softPageFaults	Soft Page Faults	Soft Page Faults	564	0	Rate	0	/sec	TR_BIT_STREAMING	14

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
UNIX Process Set Excluded	3200	swaps	Swaps	Swaps	566	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
UNIX Process Set Excluded	3200	systemCalls	System Calls	System Calls	562	0	Rate	0	/sec	DLL_ALGN_ERRORS	11
UNIX Process Set Excluded	3200	threads	Threads	Threads	563	19	Size	4		TR_SET_RECOVERY_MODE	12
UNIX Process Set Excluded	3200	totalPageFaults	Total Page Faults	Total Pg Faults	575	0	Rate	0	/sec	(TR_SIGNAL_LOSS+TR_BIT_STREAMING)	215
UNIX Process Set Excluded	3200	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes	4	(bytes)	DLL_BCASTS	4
NT Process Set Excluded	3201	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
NT Process Set Excluded	3201	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
NT Process Set Excluded	3201	cpuUtilization	CPU Utilization	CPU Utilization	596	4	Percent	1	%	DLL_BYTES	2
NT Process Set Excluded	3201	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
NT Process Set Excluded	3201	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
NT Process Set Excluded	3201	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_MCASTS	3
NT Process Set Excluded	3201	threads	Threads	Threads	563	19	Size	4		TR_SET_RECOVERY_MODE	12
NT Process Set Excluded	3201	totalPageFaults	Total Page Faults	Total Pg Faults	575	0	Rate	0	/sec	(TR_SIGNAL_LOSS+TR_BIT_STREAMING)	215
UNIX Process	3300	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
UNIX Process	3300	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
UNIX Process	3300	cpuUtilization	CPU Utilization	CPU Utilization	596	4	Percent	1	%	DLL_BYTES	2
UNIX Process	3300	diskBlockReads	Disk Block Reads	Disk Blk Reads	586	0	Rate	0	/sec	DLL_TRANSITS	7
UNIX Process	3300	diskBlockWrites	Disk Block Writes	Disk Blk Writes	587	0	Rate	0	/sec	DLL_ENET_FRAMES	8
UNIX Process	3300	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100 0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
UNIX Process	3300	hardPageFaults	Hard Page Faults	Hard Page Faults	565	0	Rate	0	/sec	TR_SIGNAL_LOSS	13
UNIX Process	3300	hardPageFaultsPct	Hard Page Faults %	Hard Pg Faults %	573	4	Percent	1	%	100 0*DELTA_TIME*(TR_SIGNAL_LOSS/(TR_SIGNAL_LOSS+TR_BIT_STREAMING))	213
UNIX Process	3300	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
UNIX Process	3300	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
UNIX Process	3300	networkMessagesIn	Network Messages In	Net Msgs In	588	0	Rate	0	/sec	DLL_COLLISIONS	9
UNIX Process	3300	networkMessagesOut	Network Messages Out	Net Msgs Out	589	0	Rate	0	/sec	DLL_ERRORS	10
UNIX Process	3300	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_MCASTS	3
UNIX Process	3300	softPageFaults	Soft Page Faults	Soft Page Faults	564	0	Rate	0	/sec	TR_BIT_STREAMING	14
UNIX Process	3300	swaps	Swaps	Swaps	566	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
UNIX Process	3300	systemCalls	System Calls	System Calls	562	0	Rate	0	/sec	DLL_ALGN_ERRORS	11
UNIX Process	3300	threads	Threads	Threads	563	19	Size	4		TR_SET_RECOVERY_MODE	12
UNIX Process	3300	totalPageFaults	Total Page Faults	Total Pg Faults	575	0	Rate	0	/sec	(TR_SIGNAL_LOSS+TR_BIT_STREAMING)	215
UNIX Process	3300	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes	4	(bytes)	DLL_BCASTS	4
NT Process	3301	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
NT Process	3301	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
NT Process	3301	cpuUtilization	CPU Utilization	CPU Utilization	596	4	Percent	1	%	DLL_BYTES	2
NT Process	3301	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
NT Process	3301	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
NT Process	3301	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
NT Process	3301	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_MCASTS	3
NT Process	3301	threads	Threads	Threads	563	19	Size	4		TR_SET_RECOVERY_MODE	12
NT Process	3301	totalPageFaults	Total Page Faults	Total Pg Faults	575	0	Rate	0	/sec	(TR_SIGNAL_LOSS+TR_BIT_STREAMING)	215
*											

APPENDIX C

TITLE: LIVEEXCEPTION SYSTEM

APPLICANT: MARK W. SYLOR, GEORGE IGLESIAS, JAY B. WOLF, WILL C. LAUER AND LAWRENCE A. STABILE

Profile ID	Profile Name	ETypE	Element Type	Description	severity	window	duration	Rule	Variable	Direction	Threshold	AND Rule	Variable	Direction	Threshold
1043	ATM - Unusual Workload	105	ATM Port	Unusually high cells In	Warning	15	60	UV	cellsIn	above	99.9	1 TOT	bandwidthIn	above	25
1043	ATM - Unusual Workload	105	ATM Port	Unusually high cells out	Warning	15	60	UV	cellsOut	above	99.9	1 TOT	bandwidthOut	above	25
1043	ATM - Unusual Workload	106	ATM Path	Unusually high cells In	Warning	15	60	UV	cellsIn	above	99.9	1 TOT	bandwidthIn	above	25
1043	ATM - Unusual Workload	106	ATM Path	Unusually high cells out	Warning	15	60	UV	cellsOut	above	99 9	1 TOT	bandwidthOut	above	25
1043	ATM - Unusual Workload	107	ATM Channel	Unusually high AAL5 PDUs In	Warning	15	60	UV	aal5PdusIn	above	99 9	1 TOT	bandwidthIn	above	25
1043	ATM - Unusual Workload	107	ATM Channel	Unusually high AAL5 PDUs out	Warning	15	60	UV	aal5PdusOut	above	99 9	1 TOT	bandwidthOut	above	25
1043	ATM - Unusual Workload	107	ATM Channel	Unusually high cells In	Warning	15	60	UV	cellsIn	above	99 9	1 TOT	bandwidthIn	above	25
1043	ATM - Unusual Workload	107	ATM Channel	Unusually high cells out	Warning	15	60	UV	cellsOut	above	99 9	1 TOT	bandwidthOut	above	25
1023	ATM for the Enterprise - Failure	105	ATM Port	ATM Port Down	Critical		30	AVAIL	availability						
1023	ATM for the Enterprise - Failure	105	ATM Port	ATM Port Speed In set too low	Minor	10	60	TOT	bandwidthIn	above	100				
1023	ATM for the Enterprise - Failure	105	ATM Port	ATM Port Speed In set too low	Minor	10	60	TOT	bandwidthIn	above	100				
1023	ATM for the Enterprise - Failure	105	ATM Port	ATM Port Speed Out set too low	Minor	10	60	TOT	bandwidthOut	above	100				
1023	ATM for the Enterprise - Failure	105	ATM Port	ATM Port Speed Out set too low	Minor	10	60	TOT	bandwidthOut	above	100				
1023	ATM for the Enterprise - Failure	105	ATM Port	Too many seconds with errors	Minor	15	60	TOT	erroredSeconds	above	5				
1023	ATM for the Enterprise - Failure	105	ATM Port	Too many seconds with severe errors	Major	5	60	TOT	sevErroredSeconds	above	0				
1023	ATM for the Enterprise - Failure	105	ATM Port	Too many unavailable seconds	Critical	5	60	TOT	unavailableSeconds	above	0				
1023	ATM for the Enterprise - Failure	106	ATM Path	ATM Path Down	Critical		30	AVAIL	availability						
1023	ATM for the Enterprise - Failure	107	ATM Channel	ATM Circuit Down	Critical		30	AVAIL	availability						
1001	ATM for the Enterprise T1 - Delay	105	ATM Port	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	75				
1001	ATM for the Enterprise T1 - Delay	105	ATM Port	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	75				
1001	ATM for the Enterprise T1 - Delay	105	ATM Port	Too many CLP1 frames In	Minor	15	60	TOT	clp1CellsInPct	above	10				
1001	ATM for the Enterprise T1 - Delay	105	ATM Port	Too many discarded cells In	Minor	15	60	TOT	discardsInPct	above	0.5				
1001	ATM for the Enterprise T1 - Delay	105	ATM Port	Too many discarded cells out	Minor	15	60	TOT	discardsOutPct	above	0 5				
1001	ATM for the Enterprise T1 - Delay	107	ATM Channel	Too many AAL5 frames discarded	Minor	15	60	TOT	aal5PdusDiscardedPct	above	1				
1001	ATM for the Enterprise T1 - Delay	107	ATM Channel	Too many CLP1 frames In	Minor	15	60	TOT	clp1CellsInPct	above	10				
1001	ATM for the Enterprise T1 - Delay	107	ATM Channel	Too many discarded cells In	Minor	15	60	TOT	discardsInPct	above	0 5				
1001	ATM for the Enterprise T1 - Delay	107	ATM Channel	Traffic In over SCR	Minor	15	60	TOT	bandwidthIn	above	100				
1001	ATM for the Enterprise T1 - Delay	107	ATM Channel	Traffic Out over SCR	Minor	15	60	TOT	bandwidthOut	above	100				
1002	ATM for the Enterprise T3 - Delay	105	ATM Port	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	90				
1002	ATM for the Enterprise T3 - Delay	105	ATM Port	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	90				
1002	ATM for the Enterprise T3 - Delay	105	ATM Port	Too many CLP1 frames In	Minor	15	60	TOT	clp1CellsInPct	above	10				
1002	ATM for the Enterprise T3 - Delay	105	ATM Port	Too many discarded cells out	Minor	15	60	TOT	discardsOutPct	above	0.5				
1002	ATM for the Enterprise T3 - Delay	107	ATM Channel	Too many AAL5 frames discarded	Minor	15	60	TOT	aal5PdusDiscardedPct	above	1				
1002	ATM for the Enterprise T3 - Delay	107	ATM Channel	Too many CLP1 frames In	Minor	15	60	TOT	clp1CellsInPct	above	10				
1002	ATM for the Enterprise T3 - Delay	107	ATM Channel	Too many discarded cells In	Minor	15	60	TOT	discardsInPct	above	0 5				
1002	ATM for the Enterprise T3 - Delay	107	ATM Channel	Traffic In over SCR	Minor	15	60	TOT	bandwidthIn	above	100				
1002	ATM for the Enterprise T3 - Delay	107	ATM Channel	Traffic Out over SCR	Minor	15	60	TOT	bandwidthOut	above	100				
1024	ATM for the Service Provider - Failure	105	ATM Port	ATM Port Down	Critical		30	AVAIL	availability						
1024	ATM for the Service Provider - Failure	105	ATM Port	Too many seconds with errors	Minor	15	60	TOT	erroredSeconds	above	5				
1024	ATM for the Service Provider - Failure	105	ATM Port	Too many seconds with severe errors	Major	1	60	TOT	sevErroredSeconds	above	0				
1024	ATM for the Service Provider - Failure	105	ATM Port	Too many unavailable seconds	Critical	1	60	TOT	unavailableSeconds	above	0				
1024	ATM for the Service Provider - Failure	106	ATM Path	ATM Path Down	Critical		30	AVAIL	availability						
1024	ATM for the Service Provider - Failure	107	ATM Channel	ATM Channel Down	Critical		30	AVAIL	availability						
1003	ATM for the Service Provider T1 - Delay	105	ATM Port	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	75				
1003	ATM for the Service Provider T1 - Delay	105	ATM Port	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	75				
1003	ATM for the Service Provider T1 - Delay	105	ATM Port	Policy Violations In	Minor	15	60	TOT	policyViolationsInPct	above	10				
1003	ATM for the Service Provider T1 - Delay	105	ATM Port	Policy Violations Out	Minor	15	60	TOT	policyViolationsOutPct	above	5				
1003	ATM for the Service Provider T1 - Delay	105	ATM Port	Too many CLP0 frames discarded	Minor	15	60	TOT	clp0DiscardsOutPct	above	0 1				
1003	ATM for the Service Provider T1 - Delay	105	ATM Port	Too many CLP1 frames In	Minor	15	60	TOT	clp1CellsInPct	above	10				
1003	ATM for the Service Provider T1 - Delay	105	ATM Port	Too many CLP1 frames out	Minor	15	60	TOT	clp1CellsOutPct	above	10				
1003	ATM for the Service Provider T1 - Delay	105	ATM Port	Too many discarded cells In	Minor	15	60	TOT	discardsInPct	above	0.5				
1003	ATM for the Service Provider T1 - Delay	105	ATM Port	Too many discarded cells out	Minor	15	60	TOT	discardsOutPct	above	0 5				
1003	ATM for the Service Provider T1 - Delay	106	ATM Path	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	100				
1003	ATM for the Service Provider T1 - Delay	106	ATM Path	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	100				
1003	ATM for the Service Provider T1 - Delay	106	ATM Path	Too many CLP0 frames discarded	Minor	15	60	TOT	clp0DiscardsPct	above	0 1				
1003	ATM for the Service Provider T1 - Delay	106	ATM Path	Too many CLP1 frames In	Minor	15	60	TOT	clp1CellsPct	above	10				
1003	ATM for the Service Provider T1 - Delay	106	ATM Path	Too many discarded cells out	Minor	15	60	TOT	discardsOutPct	above	0 5				
1003	ATM for the Service Provider T1 - Delay	107	ATM Channel	Too many CLP0 frames discarded	Minor	15	60	TOT	clp0DiscardsPct	above	0 1				
1003	ATM for the Service Provider T1 - Delay	107	ATM Channel	Too many CLP1 frames In	Minor	15	60	TOT	clp1CellsPct	above	10				
1003	ATM for the Service Provider T1 - Delay	107	ATM Channel	Too many discarded cells In	Minor	15	60	TOT	discardsInPct	above	0 5				
1003	ATM for the Service Provider T1 - Delay	107	ATM Channel	Too many discarded cells out	Minor	15	60	TOT	discardsOutPct	above	0 5				
1003	ATM for the Service Provider T1 - Delay	107	ATM Channel	Traffic In over SCR	Minor	15	60	TOT	bandwidthIn	above	100				
1003	ATM for the Service Provider T1 - Delay	107	ATM Channel	Traffic Out over SCR	Minor	15	60	TOT	bandwidthOut	above	100				
1004	ATM for the Service Provider T3 - Delay	105	ATM Port	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	90				
1004	ATM for the Service Provider T3 - Delay	105	ATM Port	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	90				
1004	ATM for the Service Provider T3 - Delay	105	ATM Port	Policy Violations In	Minor	15	60	TOT	policyViolationsInPct	above	10				
1004	ATM for the Service Provider T3 - Delay	105	ATM Port	Policy Violations Out	Minor	15	60	TOT	policyViolationsOutPct	above	5				
1004	ATM for the Service Provider T3 - Delay	105	ATM Port	Too many CLP0 frames discarded	Minor	15	60	TOT	clp0DiscardsOutPct	above	0.1				
1004	ATM for the Service Provider T3 - Delay	105	ATM Port	Too many CLP1 frames In	Minor	15	60	TOT	clp1CellsInPct	above	10				
1004	ATM for the Service Provider T3 - Delay	105	ATM Port	Too many CLP1 frames out	Minor	15	60	TOT	clp1CellsOutPct	above	10				
1004	ATM for the Service Provider T3 - Delay	105	ATM Port	Too many discarded cells In	Minor	15	60	TOT	discardsInPct	above	0 5				
1004	ATM for the Service Provider T3 - Delay	105	ATM Port	Too many discarded cells out	Minor	15	60	TOT	discardsOutPct	above	0 5				
1004	ATM for the Service Provider T3 - Delay	106	ATM Path	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	100				
1004	ATM for the Service Provider T3 - Delay	106	ATM Path	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	100				
1004	ATM for the Service Provider T3 - Delay	106	ATM Path	Too many CLP0 frames discarded	Minor	15	60	TOT	clp0DiscardsPct	above	0.1				
1004	ATM for the Service Provider T3 - Delay	106	ATM Path	Too many CLP1 frames In	Minor	15	60	TOT	clp1CellsPct	above	10				
1004	ATM for the Service Provider T3 - Delay	106	ATM Path	Too many discarded cells out	Minor	15	60	TOT	discardsInPct	above	0.5				
1004	ATM for the Service Provider T3 - Delay	107	ATM Channel	Too many CLP0 frames discarded	Minor	15	60	TOT	clp0DiscardsPct	above	0.1				
1004	ATM for the Service Provider T3 - Delay	107	ATM Channel	Too many CLP1 frames In	Minor	15	60	TOT	clp1CellsPct	above	10				
1004	ATM for the Service Provider T3 - Delay	107	ATM Channel	Too many discarded cells In	Minor	15	60	TOT	discardsInPct	above	0 5				
1004	ATM for the Service Provider T3 - Delay	107	ATM Channel	Too many discarded cells out	Minor	15	60	TOT	discardsOutPct	above	0 5				

Profile ID	Profile Name	EType	Element Type	Description	severity	window	duration	Rule	Variable	Direction	Threshold	AND Rule	Variable	Direction	Threshold
1004	ATM for the Service Provider T3 - Delay	107	ATM Channel	Traffic In over SCR	Minor	15	60	TOT	bandwidthIn	above	100				
1004	ATM for the Service Provider T3 - Delay	107	ATM Channel	Traffic Out over SCR	Minor	15	60	TOT	bandwidthOut	above	100				
1005	Ethernet Full Duplex Switch Port - Delay	0	Ethernet	Broadcast storm	Major	15	60	UV	broadcasts	above	99.99	1 TOT	broadcasts	above	200
1005	Ethernet Full Duplex Switch Port - Delay	0	Ethernet	Over Utilized	Minor	15	60	TOT	bandwidth	above	90				
1005	Ethernet Full Duplex Switch Port - Delay	0	Ethernet	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	90				
1005	Ethernet Full Duplex Switch Port - Delay	0	Ethernet	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	90				
1005	Ethernet Full Duplex Switch Port - Delay	0	Ethernet	Too many discards	Minor	15	60	TOT	discardsOutPct	above	1				
1005	Ethernet Full Duplex Switch Port - Delay	4	MIB2 LAN Full Duplex	Broadcast storm	Major	15	60	UV	nonUnicast	above	99 99	1 TOT	nonUnicast	above	200
1005	Ethernet Full Duplex Switch Port - Delay	4	MIB2 LAN Full Duplex	Over Utilized In	Major	15	60	TOT	bandwidthIn	above	90				
1005	Ethernet Full Duplex Switch Port - Delay	4	MIB2 LAN Full Duplex	Over Utilized Out	Major	15	60	TOT	bandwidthOut	above	90				
1005	Ethernet Full Duplex Switch Port - Delay	4	MIB2 LAN Full Duplex	Too many discards	Major	15	60	TOT	discardsOutPct	above	1				
1025	Ethernet Full Duplex Switch Port - Failure	0	Ethernet	LAN Down	Critical		30	AVAIL	availability						
1025	Ethernet Full Duplex Switch Port - Failure	0	Ethernet	Misconfigured - collisions on Full Duplex Ethernet Port	Major	1	60	TOT	collisionsPct	above	0				
1025	Ethernet Full Duplex Switch Port - Failure	0	Ethernet	Received frame discards	Major	15	60	TOT	discardsInPct	above	1				
1025	Ethernet Full Duplex Switch Port - Failure	0	Ethernet	Speed In set too low	Minor	10	60	TOT	bandwidthIn	above	100				
1025	Ethernet Full Duplex Switch Port - Failure	0	Ethernet	Speed Out set too low	Minor	10	60	TOT	bandwidthOut	above	100				
1025	Ethernet Full Duplex Switch Port - Failure	0	Ethernet	Too many errors	Major	15	60	TOT	errorsPct	above	5				
1025	Ethernet Full Duplex Switch Port - Failure	4	MIB2 LAN Full Duplex	LAN Down	Critical		30	AVAIL	availability						
1025	Ethernet Full Duplex Switch Port - Failure	4	MIB2 LAN Full Duplex	Misconfigured - collisions on Full Duplex Ethernet Port	Major	1	60	TOT	collisionsOutPct	above	0				
1025	Ethernet Full Duplex Switch Port - Failure	4	MIB2 LAN Full Duplex	Received frame discards	Minor	15	60	TOT	discardsInPct	above	1				
1025	Ethernet Full Duplex Switch Port - Failure	4	MIB2 LAN Full Duplex	Speed In set too low	Minor	10	60	TOT	bandwidthIn	above	100				
1025	Ethernet Full Duplex Switch Port - Failure	4	MIB2 LAN Full Duplex	Speed Out set too low	Minor	10	60	TOT	bandwidthOut	above	100				
1025	Ethernet Full Duplex Switch Port - Failure	4	MIB2 LAN Full Duplex	Too many errors	Minor	15	60	TOT	errorsPct	above	1				
1044	Ethernet Full Duplex Switch Port - Unusual Workload	0	Ethernet	High broadcasts	Warning	15	60	UV	broadcasts	above	99 9	1 TOT	bandwidth	above	10
1044	Ethernet Full Duplex Switch Port - Unusual Workload	0	Ethernet	High multicasts	Warning	15	60	UV	multicasts	above	99 9	1 TOT	bandwidth	above	10
1044	Ethernet Full Duplex Switch Port - Unusual Workload	0	Ethernet	High unicasts	Warning	15	60	UV	unicast	above	99 9	1 TOT	bandwidth	above	10
1044	Ethernet Full Duplex Switch Port - Unusual Workload	4	MIB2 LAN Full Duplex	Unusually high frames In	Warning	15	60	UV	framesIn	above	99 9	1 TOT	bandwidthIn	above	10
1044	Ethernet Full Duplex Switch Port - Unusual Workload	4	MIB2 LAN Full Duplex	Unusually high frames out	Warning	15	60	UV	framesOut	above	99 9	1 TOT	bandwidthOut	above	10
1044	Ethernet Full Duplex Switch Port - Unusual Workload	4	MIB2 LAN Full Duplex	Unusually high non-unicast frames In	Warning	15	60	UV	nonUnicastIn	above	99 9	1 TOT	bandwidthIn	above	10
1044	Ethernet Full Duplex Switch Port - Unusual Workload	4	MIB2 LAN Full Duplex	Unusually high non-unicast frames out	Warning	15	60	UV	nonUnicastOut	above	99 9	1 TOT	bandwidthOut	above	10
1006	Ethernet Half Duplex Switch Port - Delay	0	Ethernet	Broadcast storm	Major	15	60	UV	broadcasts	above	99 99	1 TOT	broadcasts	above	200
1006	Ethernet Half Duplex Switch Port - Delay	0	Ethernet	Collisions too high	Minor	15	60	TOT	collisionsPct	above	15				
1006	Ethernet Half Duplex Switch Port - Delay	0	Ethernet	Over Utilized	Minor	15	60	TOT	bandwidth	above	60				
1006	Ethernet Half Duplex Switch Port - Delay	0	Ethernet	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	50				
1006	Ethernet Half Duplex Switch Port - Delay	0	Ethernet	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	50				
1006	Ethernet Half Duplex Switch Port - Delay	0	Ethernet	Too many discards	Minor	15	60	TOT	discardsOutPct	above	1				
1006	Ethernet Half Duplex Switch Port - Delay	2	MIB2 LAN Port	Broadcast storm	Major	15	60	UV	nonUnicast	above	99 99	1 TOT	nonUnicast	above	200
1006	Ethernet Half Duplex Switch Port - Delay	2	MIB2 LAN Port	Collisions too high	Minor	15	60	TOT	collisionsOutPct	above	15				
1006	Ethernet Half Duplex Switch Port - Delay	2	MIB2 LAN Port	Over Utilized	Major	15	60	TOT	bandwidth	above	60				
1006	Ethernet Half Duplex Switch Port - Delay	2	MIB2 LAN Port	Over Utilized In	Major	15	60	TOT	bandwidthIn	above	50				
1006	Ethernet Half Duplex Switch Port - Delay	2	MIB2 LAN Port	Over Utilized Out	Major	15	60	TOT	bandwidthOut	above	50				
1006	Ethernet Half Duplex Switch Port - Delay	2	MIB2 LAN Port	Too many discards	Major	15	60	TOT	discardsOutPct	above	1				
1026	Ethernet Half Duplex Switch Port - Failure	0	Ethernet	LAN Down	Critical		30	AVAIL	availability						
1026	Ethernet Half Duplex Switch Port - Failure	0	Ethernet	Received frame discards	Major	15	60	TOT	discardsInPct	above	1				
1026	Ethernet Half Duplex Switch Port - Failure	0	Ethernet	Speed set too low	Minor	10	60	TOT	bandwidth	above	100				
1026	Ethernet Half Duplex Switch Port - Failure	0	Ethernet	Too many errors	Major	15	60	TOT	errorsPct	above	5				
1026	Ethernet Half Duplex Switch Port - Failure	2	MIB2 LAN Port	LAN Down	Critical		30	AVAIL	availability						
1026	Ethernet Half Duplex Switch Port - Failure	2	MIB2 LAN Port	Received frame discards	Minor	15	60	TOT	discardsInPct	above	1				
1026	Ethernet Half Duplex Switch Port - Failure	2	MIB2 LAN Port	Speed set too low	Minor	10	60	TOT	bandwidth	above	100				
1026	Ethernet Half Duplex Switch Port - Failure	2	MIB2 LAN Port	Too many errors	Minor	15	60	TOT	errorsPct	above	1				
1045	Ethernet Half Duplex Switch Port - Unusual Workload	0	Ethernet	High broadcasts	Warning	15	60	UV	broadcasts	above	99.9	1 TOT	bandwidth	above	10
1045	Ethernet Half Duplex Switch Port - Unusual Workload	0	Ethernet	High multicasts	Warning	15	60	UV	multicasts	above	99 9	1 TOT	bandwidth	above	10
1045	Ethernet Half Duplex Switch Port - Unusual Workload	0	Ethernet	High unicasts	Warning	15	60	UV	unicast	above	99 9	1 TOT	bandwidth	above	10
1045	Ethernet Half Duplex Switch Port - Unusual Workload	2	MIB2 LAN Port	Unusually high frames In	Warning	15	60	UV	framesIn	above	99 9	1 TOT	bandwidthIn	above	10
1045	Ethernet Half Duplex Switch Port - Unusual Workload	2	MIB2 LAN Port	Unusually high frames out	Warning	15	60	UV	framesOut	above	99.9	1 TOT	bandwidthOut	above	10
1045	Ethernet Half Duplex Switch Port - Unusual Workload	2	MIB2 LAN Port	Unusually high non-unicast frames In	Warning	15	60	UV	nonUnicastIn	above	99 9	1 TOT	bandwidthIn	above	10
1045	Ethernet Half Duplex Switch Port - Unusual Workload	2	MIB2 LAN Port	Unusually high non-unicast frames out	Warning	15	60	UV	nonUnicastOut	above	99 9	1 TOT	bandwidthOut	above	10
1018	Ethernet Shared Segment - Delay	0	Ethernet	Broadcast storm	Major	15	60	UV	broadcasts	above	99 99	1 TOT	broadcasts	above	200
1018	Ethernet Shared Segment - Delay	0	Ethernet	Collisions too high	Minor	15	60	TOT	collisionsPct	above	15				
1018	Ethernet Shared Segment - Delay	0	Ethernet	Over Utilized	Minor	15	60	TOT	bandwidth	above	40				
1018	Ethernet Shared Segment - Delay	0	Ethernet	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	30				
1018	Ethernet Shared Segment - Delay	0	Ethernet	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	30				
1018	Ethernet Shared Segment - Delay	0	Ethernet	Too many discards	Minor	15	60	TOT	discardsOutPct	above	1				
1018	Ethernet Shared Segment - Delay	2	MIB2 LAN Port	Broadcast storm	Major	15	60	UV	nonUnicast	above	99.99	1 TOT	nonUnicast	above	200
1018	Ethernet Shared Segment - Delay	2	MIB2 LAN Port	Collisions too high	Minor	15	60	TOT	collisionsOutPct	above	15				
1018	Ethernet Shared Segment - Delay	2	MIB2 LAN Port	Over Utilized	Major	15	60	TOT	bandwidth	above	60				
1018	Ethernet Shared Segment - Delay	2	MIB2 LAN Port	Over Utilized In	Major	15	60	TOT	bandwidthIn	above	50				
1018	Ethernet Shared Segment - Delay	2	MIB2 LAN Port	Over Utilized Out	Major	15	60	TOT	bandwidthOut	above	50				
1018	Ethernet Shared Segment - Delay	2	MIB2 LAN Port	Too many discards	Major	15	60	TOT	discardsOutPct	above	1				
1033	Ethernet Shared Segment - Failure	0	Ethernet	LAN Down	Critical		30	AVAIL	availability						
1033	Ethernet Shared Segment - Failure	0	Ethernet	Received frame discards	Major	15	60	TOT	discardsInPct	above	1				
1033	Ethernet Shared Segment - Failure	0	Ethernet	Speed set too low	Minor	10	60	TOT	bandwidth	above	100				
1033	Ethernet Shared Segment - Failure	0	Ethernet	Too many errors	Major	15	60	TOT	errorsPct	above	5				
1033	Ethernet Shared Segment - Failure	2	MIB2 LAN Port	LAN Down	Critical		30	AVAIL	availability						
1033	Ethernet Shared Segment - Failure	2	MIB2 LAN Port	Received frame discards	Minor	15	60	TOT	discardsInPct	above	1				
1033	Ethernet Shared Segment - Failure	2	MIB2 LAN Port	Speed set too low	Minor	10	60	TOT	bandwidthIn	above	100				
1033	Ethernet Shared Segment - Failure	2	MIB2 LAN Port	Too many errors	Minor	15	60	TOT	errorsPct	above	1				
1052	Ethernet Shared Segment - Unusual Workload	0	Ethernet	Unusually high broadcasts	Warning	15	60	UV	broadcasts	above	99 9	1 TOT	bandwidth	above	10
1052	Ethernet Shared Segment - Unusual Workload	0	Ethernet	Unusually high multicasts	Warning	15	60	UV	multicasts	above	99 9	1 TOT	bandwidth	above	10
1052	Ethernet Shared Segment - Unusual Workload	0	Ethernet	Unusually high unicasts	Warning	15	60	UV	unicast	above	99 9	1 TOT	bandwidth	above	10
1052	Ethernet Shared Segment - Unusual Workload	2	MIB2 LAN Port	Unusually high frames In	Warning	15	60	UV	framesIn	above	99 9	1 TOT	bandwidthIn	above	10

Profile ID	Profile Name	eType	Element Type	Description	severity	window	duration	Rule	Variable	Direction	Threshold	AND Rule	Variable	Direction	Threshold
1052	Ethernet Shared Segment - Unusual Workload	2	MIB2 LAN Port	Unusually high frames out	Warning	15	60	UV	framesOut	above	99.9	1 TOT	bandwidthOut	above	10
1052	Ethernet Shared Segment - Unusual Workload	2	MIB2 LAN Port	Unusually high non-unicast frames in	Warning	15	60	UV	nonUnicastIn	above	99.9	1 TOT	bandwidthIn	above	10
1052	Ethernet Shared Segment - Unusual Workload	2	MIB2 LAN Port	Unusually high non-unicast frames out	Warning	15	60	UV	nonUnicastOut	above	99.9	1 TOT	bandwidthOut	above	10
1046	Frame Relay - Unusual Workload	101	Frame Relay	Unusually high frames in	Warning	15	60	UV	framesIn	above	99 9				
1046	Frame Relay - Unusual Workload	101	Frame Relay	Unusually high frames out	Warning	15	60	UV	framesOut	above	99 9				
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Congestion in network on inbound data received	Minor	15	60	TOT	fecnInPct	above	2				
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Congestion in network on inbound data received over C	Major	15	60	TOT	fecnInPct	above	2	1 TOT	bandwidthIn	above	150
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Congestion in network on inbound data received under	Major	15	60	TOT	fecnInPct	above	2	1 TOT	bandwidthIn	below	50
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Congestion in network on outbound data sent	Minor	15	60	TOT	becnInPct	above	2				
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Congestion in network on outbound data sent over CIR	Major	15	60	TOT	becnInPct	above	2	1 TOT	bandwidthOut	above	150
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Congestion in network on outbound data sent under CIF	Major	15	60	TOT	becnInPct	above	2	1 TOT	bandwidthOut	below	50
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Over CIR In	Warning	15	60	TOT	bandwidthIn	above	150				
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Over CIR Out	Warning	15	60	TOT	bandwidthOut	above	150				
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Too many discard eligible frames received	Minor	15	60	TOT	deFramesInPct	above	5				
1027	Frame Relay for the Enterprise - Failure	101	Frame Relay	Frame Relay Circuit Down	Critical		30	AVAIL	availability						
1027	Frame Relay for the Enterprise - Failure	101	Frame Relay	Too many errors	Major	15	60	TOT	errorsPct	above	0 5				
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Backward congestion received from downstream	Minor	15	60	TOT	becnIn	above	2				
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Backward congestion sent upstream to sender	Minor	15	60	TOT	becnOut	above	2				
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Forward congestion received from upstream	Minor	15	60	TOT	fecnIn	above	2				
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Forward congestion sent downstream to receiver	Minor	15	60	TOT	fecnOut	above	2				
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	100				
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	100				
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Too many discards	Minor	15	60	TOT	discardsPct	above	1				
1028	Frame Relay for the Service Provider - Failure	101	Frame Relay	Frame Relay Circuit Down	Critical		30	AVAIL	availability						
1028	Frame Relay for the Service Provider - Failure	101	Frame Relay	Too many errors	Major	15	60	TOT	errorsPct	above	0 5				
1036	Host - Latency 2 second limit	200	Router	Latency to host too high	Minor	15	60	TOT	latency	above	2000				
1036	Host - Latency 2 second limit	201	Router	Latency to host too high	Minor	15	60	TOT	latency	above	2000				
1036	Host - Latency 2 second limit	300	Generic Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000				
1036	Host - Latency 2 second limit	301	Managewise Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000				
1036	Host - Latency 2 second limit	302	Insight Manager Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000				
1036	Host - Latency 2 second limit	303	BMC NT Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000				
1036	Host - Latency 2 second limit	304	BMC Unix Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000				
1036	Host - Latency 2 second limit	305	Empire NT Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000				
1036	Host - Latency 2 second limit	306	Empire Unix Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000				
1036	Host - Latency 2 second limit	725	RAS	Latency to host too high	Minor	15	60	TOT	latency	above	2000				
1007	Host - Unusual Latency	200	Router	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7				
1007	Host - Unusual Latency	201	Router	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7				
1007	Host - Unusual Latency	300	Generic Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7				
1007	Host - Unusual Latency	301	Managewise Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7				
1007	Host - Unusual Latency	302	Insight Manager Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7				
1007	Host - Unusual Latency	303	BMC NT Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7				
1007	Host - Unusual Latency	304	BMC Unix Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7				
1007	Host - Unusual Latency	305	Empire NT Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7				
1007	Host - Unusual Latency	306	Empire Unix Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7				
1007	Host - Unusual Latency	725	RAS	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7				
1011	Remote Access - Delay	725	RAS	Modems over used	Minor	15	60	TOT	modemsBusyPct	above	95				
1011	Remote Access - Delay	725	RAS	Too many discards on dial-in connections	Minor	15	60	TOT	discardedFramesPct	above	5				
1011	Remote Access - Delay	750	RAS CPU	CPU too busy	Minor	15	60	TOT	cpuUtilization	above	80				
1011	Remote Access - Delay	775	Modem Pool	Modems over used	Minor	15	60	TOT	modemsBusyPct	above	95				
1030	Remote Access - Failure	725	RAS	Free memory too low	Major	5	60	TOT	memoryFree	below	2000000				
1030	Remote Access - Failure	725	RAS	Remote Access Server Down	Critical		30	AVAIL	availability						
1030	Remote Access - Failure	725	RAS	Remote Access Server Unreachable	Critical		30	REACH	reachability						
1030	Remote Access - Failure	725	RAS	Too many frame errors on dial-in	Major	15	60	TOT	frameErrorsPct	above	1				
1030	Remote Access - Failure	725	RAS	Too many modem errors	Major	15	60	TOT	modemErrors	above	0 01				
1030	Remote Access - Failure	725	RAS	Too many modem retrains	Major	15	60	TOT	retrains	above	0.05				
1047	Remote Access - Unusual Workload	725	RAS	Unusually high bits in	Warning	15	60	UV	bitsIn	above	99 9	1 TOT	connectTime	above	25
1047	Remote Access - Unusual Workload	725	RAS	Unusually high bits out	Warning	15	60	UV	bitsOut	above	99 9	1 TOT	connectTime	above	25
1047	Remote Access - Unusual Workload	725	RAS	Unusually high connect time %	Warning	15	60	UV	connectTime	above	99	1 TOT	connectTime	above	25
1047	Remote Access - Unusual Workload	725	RAS	Unusually high connections	Warning	15	60	UV	connections	above	99	1 DP	connections	above	50
1047	Remote Access - Unusual Workload	725	RAS	Unusually high memory utilization	Warning	15	60	UV	memoryUsed	above	99	1 DP	memoryUsed	above	10
1047	Remote Access - Unusual Workload	725	RAS	Unusually low connect time %	Warning	15	60	UV	connectTime	below	99	1 DP	connectTime	below	50
1047	Remote Access - Unusual Workload	725	RAS	Unusually low memory utilization	Warning	15	60	UV	memoryUsed	below	99	1 DP	memoryUsed	below	10
1047	Remote Access - Unusual Workload	750	RAS CPU	Unusually high CPU utilization	Warning	15	60	UV	cpuUtilization	above	99	1 TOT	cpuUtilization	above	25
1047	Remote Access - Unusual Workload	750	RAS CPU	Unusually low CPU utilization	Warning	15	60	UV	cpuUtilization	below	99	1 DP	cpuUtilization	below	25
1047	Remote Access - Unusual Workload	775	Modem Pool	Unusually high connect time %	Warning	15	60	UV	connectTime	above	99	1 TOT	connectTime	above	25
1047	Remote Access - Unusual Workload	775	Modem Pool	Unusually low connect time %	Warning	15	60	UV	connectTime	below	99	1 DP	connectTime	below	50
1012	Response - Delay	800	Response Path	Decreased minimum response - possible route change	Warning	60	120	DP	minResponse	below	20	1 UV	minResponse	below	95
1012	Response - Delay	800	Response Path	Destination unreachable	Major	5	60	TOT	failedAttempts	above	99 99				
1012	Response - Delay	800	Response Path	Increased minimum response - possible route change	Warning	60	120	DP	minResponse	above	20	1 UV	minResponse	above	95
1012	Response - Delay	800	Response Path	No attempts made	Major	15	60	TOT	attempts	below	0.001				
1012	Response - Delay	800	Response Path	Response over limit	Minor	15	60	TOT	responseVsGoal	above	100				
1012	Response - Delay	800	Response Path	Test attempts or transactions failed	Minor	15	60	TOT	failedAttempts	above	20				
1012	Response - Delay	800	Response Path	Unusually slow response	Minor	15	60	UV	avgRespTime	above	95				
1012	Response - Delay	801	Response Path w/ Jitter	Decreased minimum response - possible route change	Warning	60	120	DP	minResponse	below	20	1 UV	minResponse	below	95
1012	Response - Delay	801	Response Path w/ Jitter	Destination unreachable	Major	5	60	TOT	failedAttempts	above	99 99				
1012	Response - Delay	801	Response Path w/ Jitter	Increased minimum response - possible route change	Warning	60	120	DP	minResponse	above	20	1 UV	minResponse	above	95
1012	Response - Delay	801	Response Path w/ Jitter	No attempts made	Major	15	60	TOT	attempts	below	0 001				
1012	Response - Delay	801	Response Path w/ Jitter	Response over limit	Major	15	60	TOT	responseVsGoal	above	100				
1012	Response - Delay	801	Response Path w/ Jitter	Test attempts or transactions failed	Major	15	60	TOT	failedAttempts	above	20				
1012	Response - Delay	801	Response Path w/ Jitter	Too much jitter	Major	15	60	TOT	jitter	above	10				
1012	Response - Delay	801	Response Path w/ Jitter	Unusually slow response	Major	15	60	UV	avgRespTime	above	95				

Profile ID	Profile Name	EType	Element Type	Description	Severity	Window	Duration	Rule	Variable	Direction	Threshold	AND Rule	Variable	Direction	Threshold
1012	Response - Delay	802	Application Response Path	Decreased minimum response - possible route change	Warning	60	120	DP	minResponse	below	20	1 UV	minResponse	below	95
1012	Response - Delay	802	Application Response Path	Destination unreachable	Major	5	60	TOT	failedAttempts	above	99.99				
1012	Response - Delay	802	Application Response Path	Increased minimum response - possible route change	Warning	60	120	DP	minResponse	above	20	1 UV	minResponse	above	95
1012	Response - Delay	802	Application Response Path	No attempts made	Major	15	60	TOT	attempts	below	0.001				
1012	Response - Delay	802	Application Response Path	Response over limit	Major	15	60	TOT	responseVsGoal	above	100				
1012	Response - Delay	802	Application Response Path	Test attempts or transactions failed	Major	15	60	TOT	failedAttempts	above	20				
1012	Response - Delay	802	Application Response Path	Unusually slow response	Major	15	60	UV	avgRespTime	above	95				
1012	Response - Delay	803	FirstSense Response Path	Response over limit	Major	15	60	TOT	responseVsGoal	above	100	1 TOT	transactions	above	0.4
1012	Response - Delay	803	FirstSense Response Path	Service threshold violations	Major	15	60	TOT	thresholdViolations	above	0				
1012	Response - Delay	805	Empire Service Response Path	Decreased minimum response - possible route change	Warning	60	120	DP	minResponse	below	20	1 UV	minResponse	below	95
1012	Response - Delay	805	Empire Service Response Path	Destination unreachable	Major	5	60	TOT	failedAttempts	above	99.99				
1012	Response - Delay	805	Empire Service Response Path	Increased minimum response - possible route change	Warning	60	120	DP	minResponse	above	20	1 UV	minResponse	above	95
1012	Response - Delay	805	Empire Service Response Path	No attempts made	Major	15	60	TOT	attempts	below	0.001				
1012	Response - Delay	805	Empire Service Response Path	Response over limit	Major	15	60	TOT	responseVsGoal	above	100				
1012	Response - Delay	805	Empire Service Response Path	Test attempts or transactions failed	Major	15	60	TOT	failedAttempts	above	20				
1012	Response - Delay	805	Empire Service Response Path	Unusually slow DNS lookup time	Minor	15	60	UV	dnsLookupTimeAvg	above	99.9				
1012	Response - Delay	805	Empire Service Response Path	Unusually slow response	Major	15	60	UV	avgRespTime	above	95				
1012	Response - Delay	805	Empire Service Response Path	Unusually slow TCP connect time	Minor	15	60	UV	tcpConnectTimeAvg	above	99.9				
1012	Response - Delay	805	Empire Service Response Path	Unusually slow transaction time	Minor	15	60	UV	transactionTimeAvg	above	99.9				
1013	Router or Switch - Delay	3	Switch Lite Backplan	Switch backplane over utilized	Minor	15	60	TOT	backplaneUtilization	above	50				
1013	Router or Switch - Delay	200	Router	Interfaces too busy	Major	15	60	TOT	avgLineUtilization	above	70				
1013	Router or Switch - Delay	200	Router	Too many discards	Major	15	60	TOT	avgPacketDiscardRate	above	5				
1013	Router or Switch - Delay	201	Router with CPU	Interfaces too busy	Major	15	60	TOT	avgLineUtilization	above	70				
1013	Router or Switch - Delay	201	Router with CPU	Too many discards	Major	15	60	TOT	avgPacketDiscardRate	above	5				
1013	Router or Switch - Delay	202	Switch Plus Backplane	Backplane over utilized	Minor	15	60	TOT	backplaneUtilization	above	50				
1013	Router or Switch - Delay	250	Router CPU	CPU too busy	Minor	15	60	TOT	cpuUtilization	above	60				
1013	Router or Switch - Delay	251	Router CPU	CPU too busy	Minor	15	60	TOT	cpuUtilization	above	60				
1013	Router or Switch - Delay	252	Switch CPU	CPU too busy	Minor	15	60	TOT	cpuUtilization	above	60				
1031	Router or Switch - Failure	200	Router	Router Down	Critical		30	AVAIL	availability						
1031	Router or Switch - Failure	200	Router	Router Unreachable	Critical		30	REACH	reachability						
1031	Router or Switch - Failure	200	Router	Too many errors in	Minor	15	60	TOT	errorsInPct	above	2				
1031	Router or Switch - Failure	200	Router	Too many errors out	Minor	15	60	TOT	errorsOutPct	above	2				
1031	Router or Switch - Failure	201	Router with CPU	Router Down	Critical		30	AVAIL	availability						
1031	Router or Switch - Failure	201	Router with CPU	Router Unreachable	Critical		30	REACH	reachability						
1031	Router or Switch - Failure	201	Router with CPU	Too many errors in	Minor	15	60	TOT	errorsInPct	above	2				
1031	Router or Switch - Failure	201	Router with CPU	Too many errors out	Minor	15	60	TOT	errorsOutPct	above	2				
1031	Router or Switch - Failure	250	Router CPU	Configuration change in Total Buffers	Warning	15	60	DP	totalBuffers	outside	10				
1031	Router or Switch - Failure	250	Router CPU	Free memory too low	Minor	15	60	TOT	freeMemory	below	2000000				
1031	Router or Switch - Failure	251	Router CPU	Configuration change in Total Buffers	Warning	15	60	DP	totalBuffers	outside	10				
1031	Router or Switch - Failure	251	Router CPU	Free memory too low	Minor	15	60	TOT	freeMemory	below	2000000				
1031	Router or Switch - Failure	251	Router CPU	Misconfigured buffers - Router buffer misses	Warning	15	60	TOT	bufferMisses	above	0.01				
1031	Router or Switch - Failure	252	Switch CPU	Bridge (spanning tree) Topology changing	Major	15	60	TOT	topologyChanges	above	0				
1031	Router or Switch - Failure	252	Switch CPU	Critical high temperature	Major	1	60	TOT	temperatureStatus	above	2.5				
1031	Router or Switch - Failure	252	Switch CPU	Fan failed	Major	1	60	TOT	fanStatus	above	2.5				
1031	Router or Switch - Failure	252	Switch CPU	Fan marginal	Minor	30	60	TOT	fanStatus	above	1.5				
1031	Router or Switch - Failure	252	Switch CPU	Free memory too low	Minor	15	60	TOT	freeMemory	below	2000000				
1031	Router or Switch - Failure	252	Switch CPU	Marginal temperature	Minor	30	60	TOT	temperatureStatus	above	1.5				
1031	Router or Switch - Failure	252	Switch CPU	Power supply 1 failed	Major	1	60	TOT	powerSupply1Status	above	2.5				
1031	Router or Switch - Failure	252	Switch CPU	Power supply 1 marginal	Minor	30	60	TOT	powerSupply1Status	above	1.5				
1031	Router or Switch - Failure	252	Switch CPU	Power supply 2 failed	Major	1	60	TOT	powerSupply2Status	above	2.5				
1031	Router or Switch - Failure	252	Switch CPU	Power supply 2 marginal	Minor	30	60	TOT	powerSupply2Status	above	1.5				
1048	Router or Switch - Unusual Workload	200	Router	Unusually high frames In	Warning	15	60	UV	totalIncomingPackets	above	99.9	1 DP	totalIncomingPackets	above	25
1048	Router or Switch - Unusual Workload	200	Router	Unusually high frames out	Warning	15	60	UV	totalOutgoingPackets	above	99.9	1 DP	totalOutgoingPackets	above	25
1048	Router or Switch - Unusual Workload	200	Router	Unusually low frames In	Warning	15	60	UV	totalIncomingPackets	below	99.9	1 DP	totalIncomingPackets	below	25
1048	Router or Switch - Unusual Workload	200	Router	Unusually low frames out	Warning	15	60	UV	totalOutgoingPackets	below	99.9	1 DP	totalOutgoingPackets	below	25
1048	Router or Switch - Unusual Workload	201	Router with CPU	Unusually high frames In	Warning	15	60	UV	totalIncomingPackets	above	99.9	1 DP	totalIncomingPackets	above	25
1048	Router or Switch - Unusual Workload	201	Router with CPU	Unusually high frames out	Warning	15	60	UV	totalOutgoingPackets	above	99.9	1 DP	totalOutgoingPackets	above	25
1048	Router or Switch - Unusual Workload	201	Router with CPU	Unusually low frames In	Warning	15	60	UV	totalIncomingPackets	below	99.9	1 DP	totalIncomingPackets	below	25
1048	Router or Switch - Unusual Workload	201	Router with CPU	Unusually low frames out	Warning	15	60	UV	totalOutgoingPackets	below	99.9	1 DP	totalOutgoingPackets	below	25
1048	Router or Switch - Unusual Workload	202	Switch Plus Backplane	Unusually high backplane utilization	Warning	15	60	UV	backplaneUtilization	above	99	1 DP	backplaneUtilization	above	25
1048	Router or Switch - Unusual Workload	202	Switch Plus Backplane	Unusually low backplane utilization	Warning	15	60	UV	backplaneUtilization	below	99	1 DP	backplaneUtilization	below	25
1048	Router or Switch - Unusual Workload	250	Router Cpu	Unusually high buffers used	Warning	15	60	UV	buffersUsed	above	99	1 DP	buffersUsed	above	25
1048	Router or Switch - Unusual Workload	250	Router Cpu	Unusually high CPU utilization	Warning	15	60	UV	cpuUtilization	above	99	1 DP	cpuUtilization	above	25
1048	Router or Switch - Unusual Workload	250	Router Cpu	Unusually low buffers used	Warning	15	60	UV	buffersUsed	below	99	1 DP	buffersUsed	below	25
1048	Router or Switch - Unusual Workload	250	Router Cpu	Unusually low free memory	Warning	15	60	UV	freeMemory	below	99	1 DP	freeMemory	below	5
1048	Router or Switch - Unusual Workload	251	Router Cpu	Unusually high buffers used	Warning	15	60	UV	buffersUsed	above	99	1 DP	buffersUsed	above	25
1048	Router or Switch - Unusual Workload	251	Router Cpu	Unusually high CPU utilization	Warning	15	60	UV	cpuUtilization	above	99	1 DP	cpuUtilization	above	25
1048	Router or Switch - Unusual Workload	251	Router Cpu	Unusually low buffers used	Warning	15	60	UV	buffersUsed	below	99	1 DP	buffersUsed	below	25
1048	Router or Switch - Unusual Workload	251	Router Cpu	Unusually low free memory	Warning	15	60	UV	freeMemory	below	99	1 DP	freeMemory	below	5
1017	Server - Delay	300	Generic Server	CPUs imbalanced	Minor	15	60	TOT	cpuImbalance	above	10				
1017	Server - Delay	300	Generic Server	CPUs too busy	Minor	15	60	TOT	avgCpuUtilization	above	90				
1017	Server - Delay	300	Generic Server	Paging too high	Minor	15	60	TOT	pagesPagedIn	above	10				
1017	Server - Delay	301	Managewise Server	CPUs imbalanced	Minor	15	60	TOT	cpuImbalance	above	10				
1017	Server - Delay	301	Managewise Server	CPUs too busy	Minor	15	60	TOT	avgCpuUtilization	above	90				
1017	Server - Delay	302	Insight Manager Server	CPUs imbalanced	Minor	15	60	TOT	cpuImbalance	above	10				
1017	Server - Delay	302	Insight Manager Server	CPUs too busy	Minor	15	60	TOT	avgCpuUtilization	above	90				
1017	Server - Delay	303	BMC NT Server	CPUs imbalanced	Minor	15	60	TOT	cpuImbalance	above	10				
1017	Server - Delay	303	BMC NT Server	CPUs too busy	Minor	15	60	TOT	avgCpuUtilization	above	90				
1017	Server - Delay	303	BMC NT Server	Paging too high	Minor	15	60	TOT	pagesPagedIn	above	10				
1017	Server - Delay	304	BMC Unix Server	CPUs imbalanced	Minor	15	60	TOT	cpuImbalance	above	10				
1017	Server - Delay	304	BMC Unix Server	CPUs too busy	Minor	15	60	TOT	avgCpuUtilization	above	90				

Profile ID	Profile Name	EType	Element Type	Description	Severity	Window	duration	Rule	Variable	Direction	Threshold	AND Rule	Variable	Direction	Threshold
1017	Server - Delay	304	BMC Unix Server	Paging too high	Minor	15	60	TOT	pagesPagedIn	above	10				
1017	Server - Delay	305	Empire NT Server	Available memory too low	Minor	5	30	TOT	physicalMemoryFree	below	4000000				
1017	Server - Delay	305	Empire NT Server	CPUs imbalanced	Minor	15	60	TOT	cpuImbalance	above	10				
1017	Server - Delay	305	Empire NT Server	CPUs too busy	Minor	15	60	TOT	avgCpuUtilization	above	90				
1017	Server - Delay	305	Empire NT Server	Paging too high	Minor	15	60	TOT	pagesPagedIn	above	10				
1017	Server - Delay	306	Empire Unix Server	CPUs imbalanced	Minor	15	60	TOT	cpuImbalance	above	10				
1017	Server - Delay	306	Empire Unix Server	CPUs too busy	Minor	15	60	TOT	avgCpuUtilization	above	90				
1017	Server - Delay	306	Empire Unix Server	Load average too high	Minor	15	60	TOT	loadAverage	above	2				
1017	Server - Delay	306	Empire Unix Server	Page scanning	Minor	15	60	TOT	pageScanRate	above	200				
1017	Server - Delay	370	Server Disk	Disk queue too long	Minor	15	60	TOT	diskQueueLength	above	2				
1017	Server - Delay	370	Server Disk	Disk too busy	Minor	15	60	TOT	diskBusyTime	above	50				
1017	Server - Delay	502	Server LAN	Collisions too high	Minor	15	60	TOT	collisionsOutPct	above	15				
1017	Server - Delay	502	Server LAN	Over Utilized	Major	15	60	TOT	bandwidth	above	60				
1017	Server - Delay	502	Server LAN	Too many discards	Major	15	60	TOT	discardsOutPct	above	1				
1017	Server - Delay	504	Server LAN Full Duplex	Over Utilized In	Major	15	60	TOT	bandwidthIn	above	90				
1017	Server - Delay	504	Server LAN Full Duplex	Over Utilized Out	Major	15	60	TOT	bandwidthOut	above	90				
1017	Server - Delay	504	Server LAN Full Duplex	Too many discards	Major	15	60	TOT	discardsOutPct	above	1				
1017	Server - Delay	600	Server WAN	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	75				
1017	Server - Delay	600	Server WAN	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	75				
1017	Server - Delay	600	Server WAN	Too many discards	Minor	15	60	TOT	discardsOutPct	above	1				
1017	Server - Delay	3101	NT Process Set	Page Faults too high	Minor	15	60	TOT	totalPageFaults	above	25				
1032	Server - Failure	300	Generic Server	Server Down	Critical		30	AVAIL	availability						
1032	Server - Failure	300	Generic Server	Server Unreachable	Critical		30	REACH	reachability						
1032	Server - Failure	300	Generic Server	Virtual memory usage too high	Major	15	60	TOT	virtualMemoryUtilization	above	90				
1032	Server - Failure	301	Managewise Server	Server Down	Critical		30	AVAIL	availability						
1032	Server - Failure	301	Managewise Server	Server Unreachable	Critical		30	REACH	reachability						
1032	Server - Failure	302	Insight Manager Server	Server Down	Critical		30	AVAIL	availability						
1032	Server - Failure	302	Insight Manager Server	Server Unreachable	Critical		30	REACH	reachability						
1032	Server - Failure	303	BMC NT Server	Server Down	Critical		30	AVAIL	availability						
1032	Server - Failure	303	BMC NT Server	Server Unreachable	Critical		30	REACH	reachability						
1032	Server - Failure	304	BMC Unix Server	Server Down	Critical		30	AVAIL	availability						
1032	Server - Failure	304	BMC Unix Server	Server Unreachable	Critical		30	REACH	reachability						
1032	Server - Failure	304	BMC Unix Server	Swap space usage too high	Major	15	60	TOT	virtualMemoryUtilization	above	90				
1032	Server - Failure	305	Empire NT Server	Paging file usage too high	Major	15	60	TOT	virtualMemoryUtilization	above	90				
1032	Server - Failure	305	Empire NT Server	Server Down	Critical		30	AVAIL	availability						
1032	Server - Failure	305	Empire NT Server	Server Unreachable	Critical		30	REACH	reachability						
1032	Server - Failure	306	Empire Unix Server	Server Down	Critical		30	AVAIL	availability						
1032	Server - Failure	306	Empire Unix Server	Server Unreachable	Critical		30	REACH	reachability						
1032	Server - Failure	306	Empire Unix Server	Swap space usage too high	Major	15	60	TOT	virtualMemoryUtilization	above	90				
1032	Server - Failure	350	User Partition	File allocation failures	Major	5	60	TOT	partitionAllocationFailures	above	0				
1032	Server - Failure	350	User Partition	Partition nearly full	Major	5	60	DT	partitionUtilization	above	99 99				
1032	Server - Failure	350	User Partition	Running out of inodes	Major	5	60	TOT	inodeUtilization	above	95				
1032	Server - Failure	352	BMC NT Partition	Partition nearly full	Major	5	60	DT	partitionUtilization	above	99 99				
1032	Server - Failure	353	BMC Unix Partition	Partition nearly full	Major	5	60	DT	partitionUtilization	above	99 99				
1032	Server - Failure	504	Server LAN	Misconfigured - collisions on Full Duplex Ethernet Port	Major	1	60	TOT	collisionsOutPct	above	0				
1032	Server - Failure	3000	System Partition	File creation failures	Major	5	60	TOT	partitionAllocationFailures	above	1				
1032	Server - Failure	3000	System Partition	Partition nearly full	Major	5	60	DT	partitionUtilization	above	99.99				
1032	Server - Failure	3000	System Partition	Running out of inodes	Major	5	60	TOT	inodeUtilization	above	95				
1032	Server - Failure	3001	BMC NT System Partition	Partition nearly full	Major	5	60	DT	partitionUtilization	above	99 99				
1032	Server - Failure	3002	BMC Unix System Partition	Partition nearly full	Major	5	60	DT	partitionUtilization	above	99 99				
1032	Server - Failure	3100	Unix Process Set	Process Set Down	Critical		30	AVAIL	availability						
1032	Server - Failure	3101	NT Process Set	Process Set Down	Critical		30	AVAIL	availability						
1051	Server - Unusual Workload	305	Empire NT Server	Unusually high number of processes	Warning	15	60	UV	processes	above	99.9	1	DP	processes	above	10
1051	Server - Unusual Workload	305	Empire NT Server	Unusually low number of processes	Warning	15	60	UV	processes	below	99 9	1	DP	processes	below	10
1051	Server - Unusual Workload	306	Empire Unix Server	Unusually high number of processes	Warning	15	60	UV	processes	above	99.9	1	DP	processes	above	10
1051	Server - Unusual Workload	306	Empire Unix Server	Unusually low number of processes	Warning	15	60	UV	processes	below	99.9	1	DP	processes	below	10
1051	Server - Unusual Workload	330	Server CPU	Persistent Unusually high CPU system (kernel) time	Warning	60	240	UV	cpuSystemUtilization	above	99	1	DP	cpuSystemUtilization	above	50
1051	Server - Unusual Workload	330	Server CPU	Persistent Unusually high IO wait time	Warning	60	240	UV	cpuWaitUtilization	above	99	1	DP	cpuWaitUtilization	above	50
1051	Server - Unusual Workload	330	Server CPU	Unusually high CPU system (kernel) time	Warning	15	60	UV	cpuSystemUtilization	above	99	1	DP	cpuSystemUtilization	above	50
1051	Server - Unusual Workload	330	Server CPU	Unusually high CPU Utilization	Warning	15	60	UV	cpuUtilization	above	99	1	TOT	cpuUtilization	above	25
1051	Server - Unusual Workload	330	Server CPU	Unusually high IO wait time	Warning	15	60	UV	cpuWaitUtilization	above	99	1	DP	cpuWaitUtilization	above	50
1051	Server - Unusual Workload	370	Disk	Unusually high disk reads	Warning	15	60	UV	diskReads	above	99.9	1	TOT	diskReads	above	20
1051	Server - Unusual Workload	370	Disk	Unusually high disk writes	Warning	15	60	UV	diskWrites	above	99 9	1	TOT	diskWrites	above	10
1051	Server - Unusual Workload	370	Disk	Unusually long disk transfer time	Warning	15	60	UV	diskAvgTransferTime	above	99 9	1	DP	diskAvgTransferTime	above	25
1051	Server - Unusual Workload	370	Disk	Unusually short transfer time	Warning	15	60	UV	diskAvgTransferTime	below	99 9	1	TOT	diskReadsWrites	above	20
1051	Server - Unusual Workload	371	Disk BMC Server	Unusually high disk accesses	Warning	15	60	UV	diskReadsWrites	above	99 9	1	TOT	diskReadsWrites	above	20
1050	Server - Unusual Workload	502	Server LAN	Unusually high frames in	Warning	15	60	UV	framesIn	above	99 9	1	TOT	bandwidthIn	above	10
1050	Server - Unusual Workload	502	Server LAN	Unusually high frames out	Warning	15	60	UV	framesOut	above	99 9	1	TOT	bandwidthOut	above	10
1050	Server - Unusual Workload	502	Server LAN	Unusually high non-unicast frames in	Warning	15	60	UV	nonUnicastIn	above	99.9	1	TOT	bandwidthIn	above	10
1050	Server - Unusual Workload	502	Server LAN	Unusually high non-unicast frames out	Warning	15	60	UV	nonUnicastOut	above	99.9	1	TOT	bandwidthOut	above	10
1049	Server - Unusual Workload	504	Server LAN Full Duplex	Unusually high frames In	Warning	15	60	UV	framesIn	above	99 9	1	TOT	bandwidthIn	above	10
1049	Server - Unusual Workload	504	Server LAN Full Duplex	Unusually high frames out	Warning	15	60	UV	framesOut	above	99 9	1	TOT	bandwidthOut	above	10
1049	Server - Unusual Workload	504	Server LAN Full Duplex	Unusually high non-unicast frames in	Warning	15	60	UV	nonUnicastIn	above	99.9	1	TOT	bandwidthIn	above	10
1049	Server - Unusual Workload	504	Server LAN Full Duplex	Unusually high non-unicast frames out	Warning	15	60	UV	nonUnicastOut	above	99.9	1	TOT	bandwidthOut	above	10
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually high Process Set CPU utilization	Warning	15	60	UV	cpuUtilization	above	99.9	1	TOT	cpuUtilization	above	10
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually high Process Set network messages	Warning	15	60	UV	networkMessages	above	99.9	1	TOT	networkMessages	above	1
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually high Process Set physical memory	Warning	15	60	UV	physicalMemoryUsed	above	99 9	1	DP	physicalMemoryUsed	above	10
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually high Process Set reads	Warning	15	60	UV	diskBlockReads	above	99.9	1	TOT	diskBlockReads	above	10
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually high Process Set writes	Warning	15	60	UV	diskBlockWrites	above	99.9	1	TOT	diskBlockWrites	above	5
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually low Process Set CPU utilization	Warning	15	60	UV	cpuUtilization	below	99 9	1	DP	cpuUtilization	below	25
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually low Process Set network messages	Warning	15	60	UV	networkMessages	below	99 9	1	DP	networkMessages	below	25

Profile ID	Profile Name	EType	Element Type	Description	Severity	window	duration	Rule	Variable	Direction	Threshold	AND Rule	Variable	Direction	Threshold
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually low Process Set physical memory	Warning	15	60	UV	physicalMemoryUsed	below	99.9	1 DP	physicalMemoryUsed	below	10
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually low Process Set reads	Warning	15	60	UV	diskBlockReads	below	99.9	1 DP	diskBlockReads	below	25
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually low Process Set writes	Warning	15	60	UV	diskBlockWrites	below	99.9	1 DP	diskBlockWrites	below	25
1051	Server - Unusual Workload	3101	NT Process Set	Unusually high Process Set CPU utilization	Warning	15	60	UV	cpuUtilization	above	99.9	1 TOT	cpuUtilization	above	10
1051	Server - Unusual Workload	3101	NT Process Set	Unusually high Process Set physical memory	Warning	15	60	UV	physicalMemoryUsed	above	99.9	1 DP	physicalMemoryUsed	above	10
1051	Server - Unusual Workload	3101	NT Process Set	Unusually high Process Set threads	Warning	15	60	UV	threads	above	99.9				
1051	Server - Unusual Workload	3101	NT Process Set	Unusually low Process Set CPU utilization	Warning	15	60	UV	cpuUtilization	below	99.9	1 DP	cpuUtilization	below	25
1051	Server - Unusual Workload	3101	NT Process Set	Unusually low Process Set physical memory	Warning	15	60	UV	physicalMemoryUsed	below	99.9	1 DP	physicalMemoryUsed	below	10
1051	Server - Unusual Workload	3101	NT Process Set	Unusually low Process Set threads	Warning	15	60	UV	threads	below	99.9				
1019	Token Ring - Delay	1	Token Ring	Over Utilized	Minor	15	60	TOT	bandwidth	above	80				
1019	Token Ring - Delay	1	Token Ring	Too many soft errors	Minor	15	60	TOT	softErrors	above	0.1				
1019	Token Ring - Delay	2	MIB2 LAN Port	Broadcast storm	Major	15	60	UV	nonUnicast	above	99.99	1 TOT	nonUnicast	above	200
1019	Token Ring - Delay	2	MIB2 LAN Port	Over Utilized	Major	15	60	TOT	bandwidth	above	80				
1019	Token Ring - Delay	2	MIB2 LAN Port	Over Utilized In	Major	15	60	TOT	bandwidthIn	above	50				
1019	Token Ring - Delay	2	MIB2 LAN Port	Over Utilized Out	Major	15	60	TOT	bandwidthOut	above	50				
1019	Token Ring - Delay	2	MIB2 LAN Port	Too many discards	Major	15	60	TOT	discardsOutPct	above	1				
1034	Token Ring - Failure	1	tokenRing	LAN Down	Critical		30	AVAIL	availability						
1034	Token Ring - Failure	1	tokenRing	Speed set too low	Minor	10	60	TOT	bandwidth	above	100				
1034	Token Ring - Failure	1	tokenRing	Too many hard errors	Major	15	60	TOT	hardErrors	above	0.1				
1034	Token Ring - Failure	2	MIB2 LAN Port	LAN Down	Critical		30	AVAIL	availability						
1034	Token Ring - Failure	2	MIB2 LAN Port	Received frame discards	Minor	15	60	TOT	discardsInPct	above	1				
1034	Token Ring - Failure	2	MIB2 LAN Port	Speed set too low	Minor	10	60	TOT	bandwidthIn	above	100				
1034	Token Ring - Failure	2	MIB2 LAN Port	Too many errors	Minor	15	60	TOT	errorsPct	above	1				
1053	Token Ring - Unusual Workload	1	tokenRing	Unusually high broadcasts	Warning	15	60	UV	broadcasts	above	99.9	1 TOT	bandwidth	above	10
1053	Token Ring - Unusual Workload	1	tokenRing	Unusually high multicasts	Warning	15	60	UV	multicasts	above	99.9	1 TOT	bandwidth	above	10
1053	Token Ring - Unusual Workload	1	tokenRing	Unusually high unicasts	Warning	15	60	UV	unicast	above	99.9	1 TOT	bandwidth	above	10
1053	Token Ring - Unusual Workload	2	MIB2 LAN Port	Unusually high frames in	Warning	15	60	UV	framesIn	above	99.9	1 TOT	bandwidthIn	above	10
1053	Token Ring - Unusual Workload	2	MIB2 LAN Port	Unusually high frames out	Warning	15	60	UV	framesOut	above	99.9	1 TOT	bandwidthOut	above	10
1053	Token Ring - Unusual Workload	2	MIB2 LAN Port	Unusually high non unicast frames in	Warning	15	60	UV	nonUnicastIn	above	99.9	1 TOT	bandwidthIn	above	10
1053	Token Ring - Unusual Workload	2	MIB2 LAN Port	Unusually high non-unicast frames out	Warning	15	60	UV	nonUnicastOut	above	99.9	1 TOT	bandwidthOut	above	10
1035	WAN - Failure	100	WAN	Received frame discards	Major	15	60	TOT	discardsInPct	above	1				
1035	WAN - Failure	100	WAN	Speed in set too low	Minor	10	60	TOT	bandwidthIn	above	100				
1035	WAN - Failure	100	WAN	Speed Out set too low	Minor	10	60	TOT	bandwidthOut	above	100				
1035	WAN - Failure	100	WAN	Too many errors	Major	15	60	TOT	errorsPct	above	1				
1035	WAN - Failure	100	WAN	WAN Link Down	Critical		30	AVAIL	availability						
1054	WAN - Unusual Workload	100	WAN	Unusually high frames in	Warning	15	60	UV	framesIn	above	99.9	1 TOT	bandwidthIn	above	10
1054	WAN - Unusual Workload	100	WAN	Unusually high frames out	Warning	15	60	UV	framesOut	above	99.9	1 TOT	bandwidthOut	above	10
1020	WAN 56K - Delay	100	WAN	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	50				
1020	WAN 56K - Delay	100	WAN	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	50				
1020	WAN 56K - Delay	100	WAN	Too many discards	Minor	15	60	TOT	discardsOutPct	above	1				
1021	WAN T1 - Delay	100	WAN	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	75				
1021	WAN T1 - Delay	100	WAN	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	75				
1021	WAN T1 - Delay	100	WAN	Too many discards	Minor	15	60	TOT	discardsOutPct	above	1				
1022	WAN T3 - Delay	100	WAN	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	90				
1022	WAN T3 - Delay	100	WAN	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	90				
1022	WAN T3 - Delay	100	WAN	Too many discards	Minor	15	60	TOT	discardsOutPct	above	1				

APPENDIX D

TITLE: LIVEEXCEPTION SYSTEM

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LiveExceptions Default Profile White Paper

Version 1.9

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Table of Contents

Table of Profiles

1 Introduction

This document describes the default profiles shipped with LiveExceptions in eHealth 4.7. It also describes their alarms, and possible actions to take to identify and correct the problem.

For a general overview of LiveExceptions, please read the white paper "*An Introduction to LiveExceptions*" before reading this document.

1.1 Audience

The primary audience of this document are the people in the Network Operations Center (NOC) responsible for resolving performance and failure problems in the network, systems, and applications being monitored. For you, the document describes each of the alarms raised by the default profiles provided in the product.

You should be familiar with Trend, At-a-Glance (AAG), and TopN reports provided in EHealth, and with using the Web User Interface to run and view those reports. You should also be familiar with using the LiveTrend user interface to monitor trend variables in real time. This document describes each alarm and recommends possible actions you can take to diagnose and repair the problem.

The secondary audience of this document is the LiveExceptions administrator who sets up profiles, and applies them to groups (or group lists) of elements as subjects for LiveExceptions to monitor.

For you, this document describes the alarm rules that make up each profile in detail. It describes what kinds of elements to which the profiles should be applied. It also forms a base from which you can develop your own rules and profiles. It describes some techniques used in developing good rules that minimize false alarms.

1.2 Profiles, Alarm Rules, and Technologies

Each profile defined below defines a collection of alarm rules that apply to a particular technology, and detects particular kinds of problems. The technology to which a profile applies, corresponds to a group technology. The technology is sometimes refined to apply to more specific kinds of elements. For example, the WAN delay profiles apply only to WAN ports, not to the ATM or Frame Relay Circuits that might be carried over them. Further, they differ based on the link speed -- faster links can sustain a higher utilization than slower links. The kinds of profiles and the problems they detect include:

- **Delay profiles**, which raise an alarm when an element is contributing to delay, either by being over utilized, or if we detect congestion.
- **Failure profiles**, which raise an alarm when the element is down. It also raises an alarm if the element is suffering too many errors (and thus has effectively failed), or if it is in danger of failing -- perhaps because it is running out of some key resource, like inodes on a Unix Partition.
- **Unusual workload profiles**, which raise an alarm if the workload presented to an element, or the work done by an element is unusual when compared against a historical baseline.
- **Host latency profiles**, which raise an alarm if the latency to a host is unusually high, or beyond any reasonable limit.
- **Response profiles**, which raise an alarm if response time problems are detected.

Each profile is described in a separate table, with an entry in the table for each alarm rule (or set of closely related rules). Included in each table are the algorithm used, the variables examined, any thresholds and parameters used in

the rules, the window examined, the severity of the alarm, a description of what the alarm means, and recommended steps you should take to diagnose and repair the problem detected.

1.3 Alarm Rule Algorithms

LiveExceptions includes a family of algorithms that detect problems. These algorithms are implemented in the LiveExceptions Server, a background process that monitors the data collected by eHealth. These algorithms are invoked by alarm rules that are written in profiles. The profiles are applied to specific groups of elements, and this instructs the LiveExceptions Server on what things to watch, and what alarms to raise. Alarm rules indicate the problem detection algorithm to use, what element types and variables to watch, and a parameters that control the algorithm such as thresholds, windows, and baselines.

Each algorithm is described in a section below. Within the tables that describe the profiles, each alarm rule refers to the algorithm(s) used by an abbreviation. The abbreviation for each algorithm is given below.

1.4 Time Over Threshold (TOT)

The time over threshold algorithm measures a variable against a fixed threshold on each poll period. It remembers the results over the recent past and measures how much time the variable was above (or below) the threshold. The period of time the algorithm looks back is called the "window", and is typically an hour.

An example of a rule using the TOT rule as written in the tables below is
Rule: (TOT, Bandwidth Utilization > 60%)
Window: 15/60 min

Parameters for the Time over threshold algorithm are:

Parameter	Description
Variable	The trend variable examined. In the example, Bandwidth Utilization.
Threshold	The value compared against. In the example, > 60%.
Analysis window	All of the samples collected during the analysis window (from the current sample time back) are examined. In the example, 60 minutes.
Condition window	The amount of time the condition must be true to raise the alarm. In the example, 15 minutes.

1.5 Time Over Dynamic Threshold (TODT)

This algorithm compares the value of a trend variable against a dynamically computed threshold. Like the Time over threshold algorithm it compares the recent samples within the window against the threshold. If enough samples are above (or below) the threshold, an alarm is raised. We measure the window and duration as monitored times, not as numbers of samples.

The threshold is computed dynamically, and sets the threshold far enough below a limit so it is unlikely that the variable will exceed some limit soon. An example is with partition space. If the partition becomes full, programs won't be able to write files, and the system may come to a halt. The system manager wants an alarm to be raised when the partition is **nearly full.** But when is the partition nearly full?

The TODT algorithm determines when a partition is nearly full by looking at recent history over a baseline period of the past few weeks. The algorithm determines how much the partition utilization typically grows and shrinks over that period. It computes the variation seen in a trend variable over the entire baseline. Variation in a variable is measured using a statistic called the standard deviation. From this standard deviation, the algorithm computes how

much room should be left free. This computation uses a percentile value specified in the rule. The larger the percentile, the larger the variation left free. This variation is then subtracted from the limit to determine the dynamic threshold.

An example of a rule using the TODT rule as written in the tables below is
Rule: (TODT, Partition Utilization > 95th percentile below 100%)
Window: 5/60 min
Baseline: 2 weeks

Parameters for the TODT algorithm are:

Parameter	Description
Variable	In the example, Partition Utilization.
Limit	In the example, 100%.
Percentile	In the example, 95%.
Baseline	In the example, 2 weeks.
Analysis window	In the example, 60 minutes.
Condition window	In the example, 15 minutes.

In the example, consider a 100 Mbyte partition whose space used has followed a very simple pattern. The partition starts at midnight 25% full. Every day, at midnight, a program runs which creates a 15 Mbyte temporary file, increasing the partition space utilization to 40%. Every day at noon, another program comes and deletes that file, returning the partition space utilization to 25% full.

If this pattern persists through the entire baseline, it is fairly easy to compute that the standard deviation is 10.6%. Using a percentile of 95%, that corresponds to a predicted variation of about 17.5%. Which means the dynamic threshold would become 82.5%. As long as the partition space utilization stayed below that figure, no alarm is raised.

Now suppose one afternoon, someone creates a 50 Mbyte file on the disk. Partition space utilization increases to 75%, and all seems well. At midnight, the temporary file is created, partition utilization rises to 90%, and an alarm is raised.

See section 12.2 for more information on statistics used in LiveExceptions.

1.6 Deviation from Normal Algorithms

Three closely related algorithms compare the value of a trend variable against its normal range of values. The normal values are computed over a baseline period (typically 6 weeks) for each hour and for each day of the week. The baseline calculation determines the mean (average value) of the variable. It also computes a statistical measure of how much the variable varies, called the *standard deviation*. From this information, the deviation from normal algorithm can use one of three techniques for determining whether the value is normal:

- absolute from mean
- percentage from mean
- deviation from mean

All three algorithms can detect if the current value is above, below, or outside (either above or below) the normal range. They all use the Time Over Threshold window to reduce noise, that is, they only raise an alarm if the value is above, below, or outside the normal range for more that the condition window, out of the analysis window.

1.7 Absolute From Mean (AFM)

Absolute from mean detects when the value is a fixed amount above or below the mean. This technique is most useful for detecting when a value has changed from a fixed or stable configuration. For example, this could be used to detect when a file system has been reconfigured and changes capacity.

An example of a rule using the AFM rule as written in the tables below is
Rule: (AFM, Total Buffers 10 buffers below mean)
Window: 15/60 min

Parameters for the AFM algorithm are:

Parameter	Description
Variable	In the example, Total Buffers.
Direction	In the example, below the normal range.
Absolute deviation	In the example, 10 buffers.
Baseline	The length of the baseline history used to compute the mean.
Analysis window	In the example, 60 minutes.
Condition window	In the example, 15 minutes.

1.8 Percent From Mean (PFM)

Percentage from mean detects when the value is above the mean by a percentage. For example, 100% above the mean detects when the value is twice the mean value. This technique is useful for detecting large changes in a value, in proportion to the average value.

An example of a rule using the PFM rule as written in the tables below is
Rule: (PFM, Broadcasts above 100% of mean)
Window: 15/60 min

Parameters for the PFM algorithm are:

Parameter	Description
Variable	In the example, Broadcasts.
Direction	In the example, above the normal range.
Percentage deviation	The value added (or subtracted if below) the mean to establish what is normal.
Baseline	The length of the baseline history used to compute the mean.
Analysis window	All of the samples collected during the analysis window (from the current sample time back) are examined. In the example, 60 minutes.
Condition window	The amount of time the condition must be true to raise the alarm. In the example, 15 minutes.

1.9 Deviation From Mean (DFM)

Deviation from mean detects when the value is above the mean by a dynamic percentile. The Percentile is computed dynamically based on the standard deviation. The higher the percentile, the further from the mean the value must be to raise the alarm. Deviation from mean dynamically determines both the mean and variation of the data. It adapts to cases where the mean changes, but the trend variable stays very close to the mean (a small standard deviation), and also to cases when the mean remains the same, but the variation from the mean is wide. Most of the rules in the unusual workload default profiles use the deviation from mean algorithm, often combined with the percentage from mean algorithm to eliminate small divergences from normal. This is described further in section 12.1.

An example of a rule using the DFM rule as written in the tables below is
Rule: (DFM, Users above 99th %-tile)
Window: 15/60 min

Parameters for the DFM algorithm are:

Parameter	Description
Variable	In the example, Users.
Direction	In the example, above the normal range.
Percentile	In the example, 99th percentile. Refer to section 12.2 for a longer description of percentiles and standard deviations.
Baseline	The length of the baseline history used to compute the mean.
Analysis window	In the example, 60 minutes.
Condition window	In the example, 15 minutes.

1.10 Availability (Avail)

The availability algorithm detects when an element is unavailable. The alarm will be cleared once eHealth sees that the element has been up for at least the length of the window defined in the alarm rule. The purpose of the window is to raise a single alarm when an element is "bouncing" up and down repeatedly.

For hosts, routers, switches, servers, and remote access servers (RAS), when the host goes down, *e*Health will be unable to ping or poll the host's agent. This will be seen as a Reachability problem first (see section 1.11 below). Later, when the host reboots and comes back up, eHealth will be able to ping and poll the host's agent. It will see that the host had rebooted, and was down, and will raise an alarm at that time.

When the child elements within LAN and WAN interfaces, modems, ISDN, CPUs, disks, partitions, processes, process sets, and response paths hosts, go down, the host's agent may remain up and can be pinged and polled. In those cases, eHealth can detect that the child has gone down when it polls the element, and raise an alarm immediately.

Parameters used in the algorithm:

Parameter	Description
Availability window	The availability alarm will be active if the element has gone down at any time during the window. It will only clear when the element has been up for the entire window. The alarm will be raised for at least one poll period

1.11 Reachability (Reach)

The reachability algorithm detects when a ping of an element's agent IP address fails.

For hosts, when the host goes down, the agent address stops responding to pings and a reachability alarm is immediately raised for the host. The normal sequence of events when a host goes down is:

1. The host goes down.
2. *e*Health pings the host's agent IP address, the ping times out. *e*Health retries the ping. When all the tries time out, the ping fails and a **Host Unreachable** alarm is raised.
3. Eventually, the host reboots and comes back online.
4. *e*Health pings the host's agent IP address, the ping succeeds. *e*Health then polls the host's agent and learns that the host rebooted, and that the host was unavailable for some time, and raises a **Host Down** alarm.
5. If *e*Health is able to ping the host's agent IP address for a continuous time equal to the window defined in the rule, the reachability alarm is cleared.

Most child elements within a host, have the same agent IP address as their host parent. *e*Health only pings an IP address once, and the results of that ping are used for all the elements with the same address. All the children have the same reachability as their parents. The default profiles therefore do not define reachability alarm rules for children. Instead these are limited to parent hosts.

Parameters for the reachability algorithm are:

Parameter	Description
Reachability window	The window determines how quickly the alarm is cleared. If the element was unreachable during the window, the alarm will stay active. It only clears when the element has been reachable for the entire window. The purpose of the window is to raise a single alarm when an element's reachability is "bouncing" up and down repeatedly.

2 Ethernet Profiles

The profiles for Ethernets cover three cases:

- **Ethernet Shared**, Ethernet segments built using 10base2 or 10base5 cabling systems (Thin Wire and Thick Wire Ethernet cables), or shared 10baseT or 100baseT Ethernets built around shared hubs.

- **Ethernet Dedicated Full Duplex Switch Port**, segments with only two stations. This profile is appropriate for dedicated Ethernet segments between a LAN switch and a device (router, system, or another switch). It is not appropriate for a segment where the switch port is connected to a hub. In that case, use the Delay – Shared Ethernet profile.

- **Ethernet Dedicated Half Duplex Switch Port**, segments with only two stations, operating in Half Duplex mode. This is most often seen as the Ethernet segment between a LAN switch and a device (router, system, or another switch) where the switch port is set to operate in Full Duplex mode.

The LAN element types used in *e*Health are:

- **Ethernet**, which most often is a shared Ethernet. MIB2LAN can fall into any of the above three cases; MIB2LAN Full Duplex can only be a Ethernet Full Duplex Switch Port.

2.1 Ethernet – Delay Profiles

For Ethernet elements, Concord provides the following delay profiles:

- Shared Ethernet – Delay, see Table 1.
- Ethernet Dedicated Half Duplex Switch Port – Delay, see Table 2.
- Ethernet Dedicated Full Duplex Switch Port – Delay, see Table 3.

Bandwidth Utilization and Ethernet Elements

This section describes Bandwidth Utilization In and Out variables and how their actual implementation depends upon the element's agent. It is useful for understanding Too Many Discards Out and Over Utilized In/Out messages.

For an Ethernet element, Bandwidth Utilization In and Bandwidth Utilization Out are based on the Bytes In and Bytes Out on this interface. The total Bandwidth Utilization is based on the total Bytes for the Ethernet segment, which is either all the bytes seen on the wire, or simply the sum of Bytes In and Bytes Out on the interface. Which is true depends on the agent and what it measures, and on the MTF used to poll the agent as shown in the table below:

If the Agent Implements ...	**Bandwidth Utilization is Based On ...**
RMON etherStats table defined in RFC1271 or RFC1757 and places the MAC interface into promiscuous mode	Promiscuous mode counts every frame and byte on the wire. The Bandwidth Utilization is the total utilization on the wire.
MIB2 and the dot3 extensions in RFC1398 or RFC1623 or the SMIv2 version RFC1650	Bandwidth Utilization is based on Bytes In + Bytes Out.
Agents in Hubs typically implement proprietary MIBs	The agents generally count all the bytes and frames on the wire.

Table 1 Ethernet Shared – Delay

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Ethernet, MIB2LAN	TOT, Bandwidth Utilization (%) >40%	15/60 min	Minor
Message:	**Over Utilized**		
Description:	The bandwidth utilization is too high for a shared Ethernet segment. High Utilization may lead to too many collisions and a loss of efficiency on the LAN. It can also lead to queuing delays in the stations on the LAN segment, as the station must wait to send frames on the LAN, and other waiting frames are delayed awaiting their turn.		
Recommendations:	• Upgrade the Ethernet LAN to a higher speed (100Mbit or 1Gbit).. • Reduce the number of stations on the LAN segment. One way to do this is split the shared LAN into multiple segments using a switch or bridge. • Replace hubs with switches. • Remove traffic from the LAN, for example, move a server to a switch port. • Check if the segment really is shared, perhaps it really is a switch port.		
Ethernet, MIB2LAN	TOT, Bandwidth Utilization In (%) >30% TOT, Bandwidth Utilization Out (%) >30%	15/60 min	Minor
Message:	**Over Utilized In** **Over Utilized Out**		
Description:	The bandwidth utilization in or the bandwidth utilization out on this interface[1] is too high for a shared Ethernet segment. High Utilization may lead to too many collisions and a loss of efficiency on the LAN. It can also lead to queuing delays in the stations on the LAN segment, as the station must wait to send frames on the LAN, and other waiting frames are delayed awaiting their turn.		
Recommendations:	• Upgrade the Ethernet LAN to a higher speed (100Mbit or 1Gbit).. • Reduce the number of stations on the LAN segment. One way to do this is split the shared LAN into multiple segments using a switch or bridge. • Replace hubs with switches. • Remove traffic from the LAN, for example, move a server to a switch port. • Check if the segment really is shared, perhaps it really is a switch port.		
Ethernet, MIB2LAN	TOT, Collisions (%) >15%	15/60 min	Minor
Message:	**Collisions too high**		

[1] For an Ethernet element, Bandwidth Utilization In and Bandwidth Utilization Out are based on the Bytes In and Bytes Out on this interface. The total Bandwidth Utilization is based on the total Bytes for the Ethernet segment, which is either all the bytes seen on the wire, or simply the sum of Bytes In and Bytes Out on the interface. Which is true depends on the agent and what it measures, and on the MTF used to poll the agent. In general, if the agent implements the RMON etherStats table defined in RFC1271 or its replacement RFC1757, and places the MAC interface into promiscuous mode to count every frame and byte on the wire, the Bandwidth Utilization is the total utilization on the wire. If the agent simply implements MIB2 and the dot3 extensions in RFC1398, its replacement RFC1623, or the SMIv2 version RFC1650, then Bandwidth Utilization is based on Bytes In + Bytes Out. Agents in Hubs typically implement proprietary MIBs which generally count all the bytes and frames on the wire.

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Description:	When multiple stations try to send on an Ethernet LAN segment at the same time, they may collide. Ethernets use collisions to decide who will send first, using a technique called CSMA/CD. Thus, on a shared Ethernet, collisions are a normal occurrence. However, too many collisions lead to a loss of efficiency, as the time spent resolving a collision and deciding which station can send uses time and bandwidth. Also note that certain failures in Ethernet end stations can cause excessive collisions. For example, if the collision detection circuit fails, then the station will continue to send after a collision, which in turn causes more collisions.		
Recommendations:	Same as for Bandwidth Over Utilized		
Ethernet, MIB2LAN	(DFM, Broadcasts > 99.9 percentile) AND (TOT, Broadcasts > 200 frames/sec)	15/60 min	Minor
Message:	**Broadcast Storm**		
Description:	Under certain conditions, the higher layer protocols using the LAN can generate too many broadcast frames. Broadcast and multicast frames pass through switches and bridges. Every station on the extended LAN must handle broadcast frames, and thus too many broadcast frames can have a significant impact on each station attached to the extended LAN. Note: An *extended LAN* is the entire collection of Ethernet segments interconnected by bridges and switches. Extended LANs are also called *broadcast domains*.		
Recommendations:	• Determine the specific protocol or protocols causing the storm. For example, run a Traffic Accountant report on protocols for a probe attached to the extended LAN. • Once the protocol generating too many broadcasts is identified, determine the reason why so many broadcasts are being sent, and correct. • Replace a switch at the top of the switch hierarchy with a router to separate broadcast domains.		
MIB2LAN, Ethernet	TOT, Discards Out % > 1%	15/60 min	Warning
Message:	**Too many discards out**		
Description:	This alarm will be raised only for LAN elements that collect interface statistics, MIB2LAN, and some Ethernet agents[Error! Bookmark not defined.]. When an interface queue grows, eventually the router, host, or switch will run out of buffers to hold the queued frames, and any additional frames that should be sent out the interface will be discarded. Discards are normal in IP networks because the TCP protocol is designed to drive the bottleneck link to saturation. The resulting congestion is then signaled back to the TCP sender as discarded (lost) packets. Too many discards lower the overall network efficiency, as the discarded packets must be resent.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Recommendations:	While most discards are due to queuing discards, there are other reasons a router may discard packets. Depending on the device, see if any of these other reasons may be causing discards: • If the link is over utilized, deal with it as described above in the discussion of the Over Utilized alarm. Note this may only move the bottleneck to another link. After increasing the speed, look to see if other links in the path are now seeing too many discards or are now over utilized. • Increase the number of buffers in the output queue. This is only appropriate if the link is not causing delay in the network, but is still discarding packets. If the link is causing significant delay, adding buffers can make it worse, without decreasing the discard rate significantly. • Implement RED (Random Early Discards) on the link. RED is a technique supported by many routers and switches to signal congestion to TCP flows before the queue fills. This has proven extremely effective in lowering discards, and improving overall network performance. However, if most of the traffic is based on UDP or protocols other than TCP/IP protocols, RED may not affect it.		

Table 2 Ethernet Half Duplex Switch Port – Delay

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Ethernet, MIB2LAN	TOT, Bandwidth Utilization (%) >60%	15/60 min	Minor
Message:	**Over Utilized**		
Description:	See the discussion for Shared Ethernet above. Because only two stations are on this segment (the switch port and the station), the bandwidth utilization can be much higher than for a shared LAN.		
Recommendations:	• Upgrade the Ethernet LAN to a higher speed (100Mbit or 1Gbit).. • Switch to a Full duplex switch port and station. • Remove traffic from the LAN, for example, if a web server is attached to the switch port, add a second server, and split the requests equally over the pair.		
Ethernet, MIB2LAN	TOT, Bandwidth Utilization In (%) >50% TOT, Bandwidth Utilization Out (%) >50%	15/60 min	Minor
Message:	**Over Utilized In** **Over Utilized Out**		
Description:	The bandwidth utilization in or the bandwidth utilization out on this interface[Error! Bookmark not defined.] is too high for a Ethernet switch port. High Utilization may lead to too many collisions and a loss of efficiency on the LAN. It can also lead to queuing delays in the stations on the LAN segment, as the station must wait to send frames on the LAN, and other waiting frames are delayed awaiting their turn. While there are only two stations on the LAN, because the stations are operating in Half Duplex mode, they can still collide.		
Recommendations:	• Upgrade the Ethernet LAN to a higher speed (100Mbit or 1Gbit).. • Remove traffic from the LAN, for example, split the workload to a server across two servers.		
Ethernet, MIB2LAN	TOT, Collisions (%) >15%	15/60 min	Minor
Message:	**Too many collisions**		
Description:	See the discussion on "Collisions Too High" for Ethernet Shared above. With only two stations on the LAN segment, the chances of a collision are significantly reduced, and thus more traffic can be sent and received on the LAN before collisions reduce the efficiency.		
Recommendations:	Same as for bandwidth over utilized		
Ethernet, MIB2LAN	(DFM, Broadcasts > 99.9percentile) AND (TOT, Broadcasts > 200 frames/sec)	15/60 min	Minor
Message:	**Broadcast Storm**		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Description:	Under certain conditions, the higher layer protocols using the LAN can generate too many broadcast frames. Broadcast and multicast frames pass through switches and bridges. Every station on the extended LAN[2] must handle broadcast frames, and thus too many broadcast frames can have a significant impact on each station attached to the extended LAN. Note: An *extended LAN* is the entire collection of Ethernet segments interconnected by bridges and switches. Extended LANs are also called *broadcast domains*.		
Recommendations:	• Determine the specific protocol or protocols causing the storm, for example by running a traffic accountant report on protocols, for a probe attached to the extended LAN. • Once the protocol generating too many broadcasts is identified, determine the reason why so many broadcasts are being sent, and correct. • Routers can be used to separate broadcast domains, so replace a switch at the top of the switch hierarchy with a router.		
MIB2LAN, Ethernet	TOT, Discards Out % > 1%	15/60 min	Warning
Message:	**Too many discards out**		
Description:	This alarm will be raised only for LAN elements that collect interface statistics, MIB2LAN, and some Ethernet agents[Error! Bookmark not defined.]. When an interface queue grows, eventually the router, host, or switch will run out of buffers to hold the queued frames, and any additional frames that should be sent out the interface will be discarded. Discards are normal in IP networks because the TCP protocol is designed to drive the bottleneck link to saturation. The resulting congestion is then signaled back to the TCP sender as discarded (lost) packets. Too many discards lower the overall network efficiency, as the discarded packets must be resent.		
Recommendations:	• While most discards are due to queuing discards, there are other reasons a router may discard packets. Depending on the device, see if any of these other reasons may be causing discards. • If the link is over utilized, deal with it as described above. Note this may only move the bottleneck to another link. After increasing the speed, look to see if other links in the path are now seeing too many discards or are now over utilized. • Increase the number of buffers in the output queue. This is only appropriate if the link is not causing delay in the network, but is still discarding packets. If the link is causing significant delay, adding buffers can make it worse, without decreasing the discard rate significantly. • Implement RED (Random Early Discards) on the link. RED is a technique supported by many routers and switches to signal congestion to TCP flows before the queue fills. This has proven extremely effective in lowering discards, and improving overall network performance. However, if most of the traffic is based on UDP, or protocols other than TCP/IP protocols, RED may not affect them.		

[2] An *extended LAN* is the entire collection of Ethernet segments interconnected by bridges and switches. Extended LANs are also called *broadcast domains*.

Table 3 Ethernet Full Duplex Switch Port – Delay

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Ethernet	TOT, Bandwidth Utilization (%) >90%	15/60 min	Minor
Message:	**Over Utilized**		
Description:	Refer to the discussion for Shared Ethernet above. Because only two stations are on this segment (the switch port and the station), and because the link operates in full duplex, the bandwidth utilization can be much higher than for a shared LAN or even a dedicated, half duplex LAN.		
Recommendations:	• Upgrade the Ethernet LAN to a higher speed (100Mbit or 1Gbit).. • Remove traffic from the LAN, for example, if a web server is attached to the switch port, add a second server, and split the requests equally over the pair.		
MIB2LAN Full Duplex, Ethernet	TOT, Bandwidth Utilization In (%) >90% TOT, Bandwidth Utilization Out (%) >90%	15/60 min	Minor
Message:	**Over Utilized In** **Over Utilized Out**		
Description:	The bandwidth utilization in or the bandwidth utilization out on this interface is too high. High Utilization may lead to queuing delays as waiting frames are delayed awaiting their turn.		
Recommendations:	• Upgrade the Ethernet LAN to a higher speed (100Mbit or 1Gbit).. • Remove traffic from the LAN, for example, split the workload on a web server across multiple web servers.		
Ethernet, MIB2LAN	(DFM, Broadcasts > 99.9percentile) AND (TOT, Broadcasts > 200 frames/sec)	15/60 min	Minor
Message:	**Broadcast Storm**		
Description:	Under certain conditions, the higher layer protocols using the LAN can generate too many broadcast frames. Broadcast and multicast frames pass through switches and bridges. Every station on the extended LAN must handle broadcast frames, and thus too many broadcast frames can have a significant impact on each station attached to the extended LAN. Note: An *extended LAN* is the entire collection of Ethernet segments interconnected by bridges and switches. Extended LANs are also called *broadcast domains.*		
Recommendations:	• Determine the specific protocol or protocols causing the storm. For example, run a Traffic Accountant report on protocols for a probe attached to the extended LAN. • Once the protocol generating too many broadcasts is identified, determine the reason why so many broadcasts are being sent, and correct it. • Routers can be used to separate broadcast domains, so replace a switch at the top of the switch hierarchy with a router.		
MIB2LAN Full Duplex, Ethernet	TOT, Discards Out % > 1%	15/60 min	Warning
Message:	**Too many discards out**		
Description:	This alarm will be raised only for LAN elements that collect interface statistics, MIB2LAN, and some Ethernet agents. When an interface queue grows, eventually the router, host, or switch will run out of buffers to hold the queued frames, and any additional frames that should be sent out the interface will be discarded. Discards are normal in IP networks because the TCP protocol is designed to drive the bottleneck link to saturation. The resulting congestion is then signaled back to the TCP sender as discarded (lost) packets. Too many discards lower the overall network efficiency, as the discarded packets must be resent.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Recommendations:	• While most discards are due to queuing discards, there are other reasons a router may discard packets. Depending on the device, see if any of these other reasons may be causing discards. • If the link is over utilized, deal with it as described above. Note this may only move the bottleneck to another link. After increasing the speed, look to see if other links in the path are now seeing too many discards or are now over utilized. • Increase the number of buffers in the output queue. This is only appropriate if the link is not causing delay in the network, but is still discarding packets. If the link is causing significant delay, adding buffers can make it worse, without decreasing the discard rate significantly. • Implement RED (Random Early Discards) on the link. RED is a technique supported by many routers and switches to signal congestion to TCP flows before the queue fills. This has proven extremely effective in lowering discards, and improving overall network performance. However, if most of the traffic is based on UDP, or protocols other than TCP/IP protocols, RED may not affect them.		

2.2 Ethernet Failure Profiles

For Ethernet elements, we provide the following failure profiles:

- Shared Ethernet – Failure, see Table 4.
- Ethernet Half Duplex Switch Port – Failure, see Table 4.
- Ethernet Full Duplex Switch Port – Failure, see Table 5.

See the delay profiles for a description of when it is appropriate to use these three failure profiles.

Table 4 Ethernet Shared Segment – Failure, and Ethernet Half Duplex Switch Port – Failure

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Ethernet, MIB2LAN	Availability	30 min	Critical
Message:	**LAN Down**		
Description:	How LAN availability is measured depends on the agent monitoring the LAN: • If the agent is built in to a hub or repeater, then if the hub or repeater is down, the LAN is down. Note that some of the stations on the LAN may still be able to communicate, but the LAN will be partitioned. • If the agent is a promiscuous listening station (for example an RMON enabled MAC stations supporting the etherStats MIB, then the state of the station determines the state of the LAN. • If the agent is a station that supports the dot3 MIB defined in RFC1284 and in RFC1643 and RFC1650 that replaced it, then the station state determines the LAN state.		
Recommendations:	• Drilldown to an AAG report for this LAN to see if any problems led up to the failure.		
Ethernet	TOT, Errors (%) > 5%		
Message:	**Too many errors**		
Description:	The percentage of frames sent on the Ethernet with errors is too high.		
Recommendations:	Investigate • Alignment errors • Too many collisions • Late collisions • Runt (too small) frame • Babbling stations (stations always sending)		
Ethernet, MIB2LAN	TOT, Discards In % > 1%	15/60 min	Major
Message:	**Received Frame discards**		

Description:	Too many frames were discarded after they were received
	
	A frame going through a router or switch gets processed by three processes, a receiving process (frames in), a forwarding process, and a sending process (frames out). Layer 2 forwarding (done by a switch or bridge) forwards frames, while layer 3 forwarding (done by a router) forwards packets. The frame can be discarded (lost) in any of the three processes.
	
	Frames lost in **sending** are generally lost due to queue losses (refer to the discussion of too many discards out above).
	Packets lost in layer 3 **forwarding** are generally lost because the destination is unknown or unreachable. Frames are rarely lost in layer 2 forwarding.
	Frames lost in **receiving** (In frames) can be lost for a variety of reasons:
	• The receive process may not have enough buffers to hold the incoming frames.
	• The router or switch may use *input queueing* a technique where frames are buffered (queued) in the receiving interface hardware. Other designs are
	  • *shared memory* where a central memory is used to hold frames. In this design the receiving interface and sending interface access the shared memory to read and write the frames.
	  • *output queueing* where the frames are held in buffers in the sending interface.
	When a router or switch uses input queueing, if an outbound link is too busy, the input queues in the receiving interface fill up, and discard frames.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Recommendations:	• Increase the amount of memory (buffers) allocated to the receiving interface. • If the router or switch uses input queueing, check the output interfaces to see which (if any) are too busy. If any are, solve that problem. • Check to see if there are any other errors which may be causing this interface to discard frames.		
Ethernet	TOT, Bandwidth Utilization > 100%	15/60 min	Minor
Message:	**Speed set too low**		
Description:	The bandwidth utilization was measured at over 100%. This is most often caused by the speed being set incorrectly in the poller configuration.		
Recommendations:	• Check the speed of the shared segment. For example, if it is set to 10Mit/sec is the speed really 100 Mbit/sec? • Check if the segment is really a full duplex switch port, if so, change the element type (to MIB2LAN Full Duplex). This probably means changing the MTF, and may mean recertifying the device.		

Table 5 Full Duplex Switch Port – Failure

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Ethernet	Availability	30 min	Critical
Message:	**LAN Down**		
Description:	How LAN availability is measured depends on the agent monitoring the LAN. • If the agent is built in to a hub or repeater, then if the hub or repeater is down, the LAN is down. Note that some of the stations on the LAN may still be able to communicate, but the LAN will be partitioned. • If the agent is a promiscuous listening station (for example an RMON enabled MAC stations supporting the etherStats MIB, then the state of the station determines the state of the LAN. • If the agent is a station that supports the dot3 MIB defined in RFC1284 and in RFC1643 and RFC1650 that replaced it, then the station state determines the LAN state.		
Recommendations:	• Drilldown to an AAG report for this LAN to see if any problems led up to the failure.		
Ethernet	TOT, Errors (%) > 5%	15/60 min	Major
Message:	**Too many errors**		
Description:	The percentage of frames sent on the Ethernet with errors is too high.		
Recommendations:	Investigate • Alignment errors • Too many collisions • Late collisions • Runt (too small) frame • Babbling stations (stations always sending)		
Ethernet	TOT, Collisions (%) >0%	1/60 min	Major
Message:	**Misconfigured – collisions on Full Duplex Ethernet Port**		
Description:	Switch ports operating in full duplex mode should not experience collisions. However, both the switch port, and the station must be set up to use full duplex. If either is misconfigured, the LAN segment will experience collisions.		
Recommendations:	• Check that both the stations and the switch port support full duplex. • Check that both are properly configured to be in full duplex mode. • You may have applied the full duplex profile to the wrong element.		
Ethernet, MIB2LAN Full Duplex	TOT, Discards In % > 1%	15/60 min	Major
Message:	**Received Frame discards**		

Element Type	Rule, Trend Variable, Threshold	Window	Severity

Description:	Too many frames were discarded after they were received.
	
	A frame going through a router or switch gets processed by three processes, a receiving process (frames in), a forwarding process, and a sending process (frame out). The frame (packet) can be discarded (lost) in any of the three processes.
	
	Packets lost in **sending** are generally lost due to queue losses (refer to the discussion of too many discards out above).
	Packets lost in **forwarding** are generally lost because the destination is unknown or unreachable.
	Packets lost in **receiving** (In frames) can be lost for a variety of reasons:
	• The receive process may not have enough buffers to hold the incoming frames.
	• The router or switch may use *input queueing* a technique where frames are buffered (queued) in the receiving interface hardware. Other designs are
	  • *shared memory* where a central memory is used to hold frames. In this design the receiving interface and sending interface access the shared memory to read and write the frames.
	  • *output queueing* where the frames are held in buffers in the sending interface.
	When a router or switch uses input queueing, if an outbound link is too busy, the input queues in the receiving interface fill up, and discard frames.		

Recommendations:	• Increase the amount of memory (buffers) allocated to the receiving interface. • If the router or switch uses input queueing, check the output interfaces to see which (if any) are too busy. If there are, solve that problem. • Check to see if there are any other errors which may be causing this interface to discard frames.		
Ethernet, MIB2LAN Full Duplex	TOT, Bandwidth Utilization > 100%	15/60 min	Minor
Message:	**Speed set too low**		
Description:	The bandwidth utilization was measured at over 100%. This is most often caused by the speed being set incorrectly in the poller configuration.		
Recommendations:	• Check the speed of the shared segment. For example, if it is set to 10Mit/sec is the speed really 100 Mbit/sec?		

2.3 Ethernet – Unusual Workload Profiles

For Ethernets, three Unusual Workload profiles are provided. They are all the same.

Table 6 Shared Ethernet Segment – Unusual Workload, Ethernet Half Duplex Switch Port – Unusual Workload, and Ethernet Full Duplex Switch Port – Unusual Workload

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Ethernet	(DFM, Broadcasts above 99.9 percentile) AND (TOT, Bandwidth Utilization > 10%)	15/60 min	Warning
Message:	**Unusually high broadcasts**		
Description:	The number of broadcast frames on the LAN is unusually high. The rule is combined with a test that Bandwidth Utilization is > 10% to filter out unusually high, but very small, values. Refer to 12.1.		
Recommendations:	• High broadcasts without high unicasts may precede broadcast storms. • ARP (the address resolution protocol used in IP networks) sends broadcast packets to locate stations that have a particular IP address, or a router that can forward a packet to that IP address. An unusually high number of broadcast frames may indicate problems in ARP. • Similarly, any other protocol that uses broadcast frames to locate other systems or services may be having a problem finding those systems or services. • A new application or protocol may have been added to the Extended LAN that uses broadcast frames.		
Ethernet	(DFM, Multicasts above 99.9 percentile) AND (TOT, Bandwidth Utilization > 10%)	15/60 min	Warning
Message:	**Unusually high multicasts**		
Description:	The number of multicast frames on the LAN is unusually high. The rule is combined with a test that Bandwidth Utilization is > 10% to filter out unusually high, but very small, values. See 12.1. Multicast frames are used like broadcast frames in location protocols to find systems or services. Like broadcast frames, they flood through the entire extended LAN. However, because multicasts are protocol specific, only hosts participating in the protocol receive them and must process them.		
Recommendations:	• High multicasts without high unicasts may precede multicast storms. • A protocol that uses multicast frames to locate other systems or services may be having a problem finding those systems or services. • A new application or protocol may have been added to the Extended LAN that uses multicast frames.		
Ethernet	(DFM, Unicasts above 99.9 percentile) AND (TOT, Bandwidth Utilization > 10%)	15/60 min	Warning
Message:	**Unusually high unicasts**		
Description:	The number of unicast frames on the LAN is unusually high. The rule is combined with a test that Bandwidth Utilization is > 10% to filter out unusually high, but very small, values.		
Recommendations:	• A new application or protocol may have been added to the Extended LAN.		
MIB2LAN Port, MIB2LAN Full Duplex	(DFM, Frames In above 99 percentile) AND (TOT, Bandwidth Utilization In > 10%) (DFM, Frames Out above 99 percentile) AND (TOT, Bandwidth Utilization Out > 10%)	15/60 min	Warning
Message:	**Unusually high frames in** **Unusually high frames out**		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Description:	The number of frames on the LAN is unusually high. The rule is combined with a test that Bandwidth Utilization is > 10% to filter out unusually high, but very small, values.		
Recommendations:	• A new application or protocol may have been added to the Extended LAN.		
MIB2LAN Port, MIB2LAN Full Duplex	(DFM, Non-Unicast Frames In above 99 percentile) AND (TOT, Bandwidth Utilization In > 10%) (DFM, Non-Unicast Frames Out above 99 percentile)) AND (TOT, Bandwidth Utilization Out > 10%)	15/60 min	Warning
Message:	**Unusually high non-unicast frames in** **Unusually high non-unicast frames out**		
Description:	The number of non-unicast frames on the LAN is unusually high. The rule is combined with a test that Bandwidth Utilization is > 10% to filter out unusually high, but very small, values. MIB2LAN elements combine broadcast and multicast frames into a category called non-unicast frames. As described above, broadcast and multicast frames are often used in protocols to locate systems and services.		
Recommendations:	• High broadcasts and multicasts without high unicasts may precede broadcast storms. • ARP (the address resolution protocol used in IP networks) sends broadcast packets to locate stations that have a particular IP address, or a router that can forward a packet to that IP address. An unusually high number of broadcast frames may indicate problems in ARP. • Similarly, any other protocol that uses broadcast or multicast frames to locate other systems or services may be having a problem finding those systems or services. • A new application or protocol may have been added to the Extended LAN that uses broadcast or multicast frames.		

3 Token Ring Profiles

Three profiles are provided for Token Ring LANs:

- Token Ring – Delay, see Table 7.
- Token Ring – Failure, see Table 8.
- Token Ring – Unusual Workload, see Table 9.

Token rings can be represented by elements whose type is:

- Token Ring, which generally represents a station or hub that monitors the total traffic on the LAN
- MIB2 LAN, which generally represents a station on the LAN that monitors only the traffic it sends and receives.

3.1 Token Ring – Delay Profile

Table 7 Token Ring - Delay

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Token Ring, MIB2LAN	TOT, Bandwidth Utilization > 80%	15/60 min	Minor
Message:	**Over Utilized**		
Description:	The bandwidth utilization is too high for a shared Token Ring LAN. High Utilization leads to queueing delays in the stations on the LAN, as the station must wait for the token to be released by other stations before it can send a frame on the LAN, and other waiting frames are delayed awaiting their turn.		
Recommendations:	• Upgrade the Token Ring to a higher speed LAN, 4Mbps to 16Mbps, or upgrade to 100 Mbps FDDI or 100Mbps or 1Gbps Ethernet. • Reduce the number of stations on the Ring. • Remove traffic from the LAN.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Token Ring	TOT, Soft Errors > 0.1 errors/sec	15/60 min	Minor
Message:	**Too many soft errors**		
Description:	Soft errors are recoverable errors at the MAC layer of the LAN.		
Recommendations:	1. Determine the specific type of error. 2. Run a Trend Report for this Token Ring for the days where the alarm is active selecting the following soft error variables: • TR Abort Errors • TR Address Copied Errors • TR Burst Errors • TR Congestion Errors • TR Frequency Errors • TR Frame Copied Errors • TR Internal Errors • TR Line Errors • TR Lost Frame Errors • TR Token Errors 3. Select the chart style of stacked area or stacked bar chart. 4. The color of the areas or bars should identify which specific type of soft errors have occurred. Correct that problem.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
MIB2LAN	TOT, Bandwidth Utilization In (%) >50% TOT, Bandwidth Utilization Out (%) >50%	15/60 min	Minor
Message:	**Over Utilized In** **Over Utilized Out**		
Description:	The bandwidth utilization in or the bandwidth utilization out on this interface is too high for a Token Ring. High Utilization may lead to queueing delays in the stations on the LAN segment, as the station must wait for the token to be released by other stations before it can send a frame on the LAN, and other waiting frames are delayed awaiting their turn.		
Recommendations:	• Upgrade the Token Ring to a higher speed LAN, 4Mbps to 16Mbps, or upgrade to 100 Mbps FDDI or 100Mbps or 1Gbps Ethernet. • Reduce the number of stations on the Ring. • Remove traffic from the LAN.		
MIB2LAN	(DFM, Non-Unicasts > 99.9percentile) AND (TOT, Non-Unicasts > 200 frames/sec)	15/60 min	Minor
Message:	**Broadcast Storm**		
Description:	Under certain conditions, the higher layer protocols using the LAN can generate too many broadcast frames. Broadcast and multicast frames pass through switches and bridges. Every station on the extended LAN must handle broadcast frames, and thus too many broadcast frames can have a significant impact on each station attached to the extended LAN.		
Recommendations:	• Determine the specific protocol or protocols causing the storm. For example, runn a Traffic Accountant report on protocols for a probe attached to the extended LAN. • Once the protocol generating too many broadcasts is identified, determine the reason why so many broadcasts are being sent, and correct it. • Routers can be used to separate broadcast domains, so replace a switch at the top of the switch hierarchy with a router.		
MIB2LAN	TOT, Discards Out % > 1%	15/60 min	Warning
Message:	**Too many discards out**		
Description:	This alarm will be raised only for Token Ring LAN elements that collect interface statistics MIB2LAN. When an interface queue grows, eventually the router, host, or switch will run out of buffers to hold the queued frames, and any additional frames that should be sent out the interface will be discarded. Discards are normal in IP networks because the TCP protocol is designed to drive the bottleneck link to saturation. The resulting congestion is then signaled back to the TCP sender as discarded (lost) packets. Too many discards lower the overall network efficiency, as the discarded packets must be resent.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Recommendations:	While most discards are due to queueing discards, there are other reasons a router may discard packets. Depending on the device, see if any of these other reasons may be causing discards: • If the link is over utilized, deal with it as described above. Note this may only move the bottleneck to another link. After increasing the speed, look to see if other links in the path are now seeing too many discards or are now over utilized. • Increase the number of buffers in the output queue. This is only appropriate if the link is not causing delay in the network, but is still discarding packets. If the link is causing significant delay, adding buffers can make it worse, without decreasing the discard rate significantly. • Implement RED (Random Early Discards) on the link. RED is a technique supported by many routers and switches to signal congestion to TCP flows before the queue fills. This has proven extremely effective in lowering discards, and improving overall network performance. However, if most of the traffic is based on UDP, or protocols other than TCP/IP protocols, RED may not affect them.		

3.2 Token Ring – Failure Profile

Table 8 Token Ring - Failure

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Token Ring	Availability	30 min	Critical
Message:	**LAN Down**		
Description:	How LAN availability is measured depends on the agent monitoring the LAN. • If the agent is built into a hub or repeater, then if the hub or repeater is down, the LAN is down. Note that some of the stations on the LAN may still be able to communicate, but the LAN will be partitioned. • If the agent is a promiscuous listening station (for example an RMON enabled MAC stations supporting the tokenringMLStats MIB), then the state of the station determines the state of the LAN.		
Recommendations:	• Drilldown to an AAG report for this LAN to see if any problems led up to the failure.		
Token Ring	TOT, Hard Errors > 0.01 errors/sec	15/60 min	Major
Message:	**Too many hard errors**		
Description:	Hard errors are fatal errors that may be recovered from, but which often indicate a hardware failure in the ring. Hard failures include: TR Set Recovery Mode, TR Signal Loss, TR Bit Streaming, and TR Contention Mode errors.		
Recommendations:	• Drilldown to an AAG report to see the history of this problem.		
MIB2LAN	TOT, Errors (%) > 5%		
Message:	**Too many errors**		
Description:	The percentage of frames sent on the LAN with errors is too high.		
Recommendations:	• Drilldown to an AAG to diagnose the problem.		
MIB2LAN	TOT, Discards In % > 1%	15/60 min	Major
Message:	**Received Frame discards**		

Description:	Too many frames were discarded after they were received
	
	A frame going through a router or switch gets processed by three processes, a receiving process (frames in), a forwarding process, and a sending process (frame out). The frame (packet) can be discarded (lost) in any of the three processes.
	
	Packets lost in **sending** are generally lost due to queue losses (refer to the discussion of too many discards out above).
	Packets lost in **forwarding**are generally lost because the destination is unknown or unreachable.
	Packets lost in **receiving** (In frames) can be lost for a variety of reasons.
	• The receive process may not have enough buffers to hold the incoming frames.
	• The router or switch may use *input queueing* a technique where frames are buffered (queued) in the receiving interface hardware. Other designs are
	  • *shared memory* where a central memory is used to hold frames. In this design the receiving interface and sending interface access the shared memory to read and write the frames.
	  • *output queueing* where the frames are held in buffers in the sending interface.
	When a router or switch uses input queueing, if an outbound link is too busy, the input queues in the receiving interface fill up, and discard frames.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Recommendations:	• Increase the amount of memory (buffers) allocated to the receiving interface. • If the router or switch uses input queueing, check the output interfaces to see which (if any) are too busy. If any are, solve that problem. • Check to see if there are any other errors which may be causing this interface to discard frames.		
MIB2LAN	TOT, Bandwidth Utilization > 100%	15/60 min	Minor
Message:	**Speed set too low**		
Description:	The bandwidth utilization was measured at over 100%. This is most often caused by the speed being set incorrectly in the poller configuration.		
Recommendations:	• Check the speed of the ring. For example, if it is set to 4Mit/sec, is the speed really 16Mbit/sec?		

3.3 Token Ring – Unusual Workload Profile

Table 9 Token Ring - Unusual Workload

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Token Ring	(DFM, Broadcasts above 99.9 percentile) AND (TOT, Bandwidth Utilization > 10%)	15/60 min	Warning
Message:	**Unusually high broadcasts**		
Description:	The number of broadcast frames on the LAN is unusually high. The rule is combined with a test that Bandwidth Utilization is > 10% to filter out unusually high, but very small, values. Refer to 12.1.		
Recommendations:	• High broadcasts without high unicasts may precede broadcast storms. • ARP (the address resolution protocol used in IP networks) sends broadcast packets to locate stations that have a particular IP address, or a router that can forward a packet to that IP address. An unusually high number of broadcast frames may indicate problems in ARP. • Similarly, any other protocol that uses broadcast frames to locate other systems or services may be having a problem finding those systems or services. • A new application or protocol may have been added to the Extended LAN that uses broadcast frames.		
Token Ring	(DFM, Multicasts above 99.9 percentile) AND (TOT, Bandwidth Utilization > 10%)	15/60 min	Warning
Message:	**Unusually high multicasts**		
Description:	The number of multicast frames on the LAN is unusually high. The rule is combined with a test that Bandwidth Utilization is > 10% to filter out unusually high, but very small, values. Refer to 12.1. Multicast frames are used like broadcast frames in location protocols to find systems or services. Like broadcast frames, they flood through the entire extended LAN. However, because multicasts are protocol specific, only hosts participating in the protocol receive them and must process them.		
Recommendations:	• High multicasts without high unicasts may precede multicast storms. • A protocol that uses multicast frames to locate other systems or services may be having a problem finding those systems or services. • A new application or protocol may have been added to the Extended LAN that uses multicast frames.		
Token Ring	(DFM, Unicasts above 99.9 percentile) AND (TOT, Bandwidth Utilization > 10%)	15/60 min	Warning
Message:	**Unusually high unicasts**		
Description:	The number of unicast frames on the LAN is unusually high. The rule is combined with a test that Bandwidth Utilization is > 10% to filter out unusually high, but very small, values.		
Recommendations:	• A new application or protocol may have been added to the Extended LAN.		
MIB2LAN Port	(DFM, Frames In above 99 percentile) AND (TOT, Bandwidth Utilization In > 10%) (DFM, Frames Out above 99 percentile) AND (TOT, Bandwidth Utilization Out > 10%)	15/60 min	Warning
Message:	**Unusually high frames in** **Unusually high frames out**		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Description:	The number of frames on the LAN is unusually high. The rule is combined with a test that Bandwidth Utilization is > 10% to filter out unusually high, but very small, values.		
Recommendations:	• A new application or protocol may have been added to the Extended LAN.		
MIB2LAN Port	(DFM, Non-Unicast Frames In above 99 percentile) AND (TOT, Bandwidth Utilization In > 10%) (DFM, Non-Unicast Frames Out above 99 percentile)) AND (TOT, Bandwidth Utilization Out > 10%)	15/60 min	Warning
Message:	**Unusually high non-unicast frames in** **Unusually high non-unicast frames out**		
Description:	The number of non-unicast frames on the LAN is unusually high. The rule is combined with a test that Bandwidth Utilization is > 10% to filter out unusually high, but very small, values. MIB2LAN elements combine broadcast and multicast frames into a category called non-unicast frames. As described above, broadcast and multicast frames are often used in protocols to locate systems and services.		
Recommendations:	• High broadcasts and multicasts without high unicasts may precede broadcast storms. • ARP (the address resolution protocol used in IP networks) sends broadcast packets to locate stations that have a particular IP address, or a router that can forward a packet to that IP address. An unusually high number of broadcast frames may indicate problems in ARP. • Similarly, any other protocol that uses broadcast or multicast frames to locate other systems or services may be having a problem finding those systems or services. • A new application or protocol may have been added to the Extended LAN that uses broadcast or multicast frames.		

4 WAN Profiles

The WAN profiles apply to elements whose types include WAN and Server WAN. Thus this profile can be applied to a LAN/WAN group with the appropriate elements, or a Server group, again based on their interface speeds.

Profiles supported include Delay profiles, Failure profiles, and Unusual Workload profiles.

4.1 WAN – Delay Profiles

Separate WAN Delay profiles are provided for different ranges of link speeds. The following table describes them.

Profile	Supported Speed Links	Link Speed Range
56K profile	low speed links	links with speed 256 ≤ Kbps.
T1 profile	moderate speed links	links with speeds from 256 Kbps to 3 Mbps.
T3 profile	high speed links	links with speed above 3Mbps.

The main difference between the profiles is in the acceptable bandwidth utilization. Higher speed links can support a higher utilization than lower speed links. This is seen in the threshold used in the over utilized alarms. Otherwise, these profiles are the same, and all are described in Table 10.

Table 10 WAN 56K – Delay, WAN T1 – Delay, and WAN T3 – Delay

Element Type	Rule, Trend Variable, Threshold	Window	Severity
WAN	TOT, Bandwidth Utilization In > *x*% TOT, Bandwidth Utilization Out > *x*%	15/60 min	Minor
Message:	**Over Utilized In** **Over Utilized Out**		
Description:	The WAN link is carrying too much traffic In or Out. As traffic builds on an outbound link, when a frame arrives that is to be sent on that link, it will be queued until the link becomes free. Since each frame must wait for the frames queued in front of it to be serviced, longer queues add more delay to the latency of the packet. The faster the link, the higher the utilization that can be supported. Three speed ranges are supplied, 56K, T1, and T3. The **56K** profile supports low speed links, links with speed 256 ≤ Kbps, *x* = 50%. The **T1** profile supports moderate speed links, links with speed 3 Mbps, x = 75%. The **T3** profile supports high speed links, links with speed above 3Mbps, x = 90%.		
Recommendations:	• Get a faster circuit, for example, upgrade a 128 Kbps ISDN link to a fractional T1 at 256 Kbps. • Setup up a parallel circuit, and split the traffic equally between the two circuits. • Reroute traffic, if you have a mesh network with redundant paths, you may be able to change the routing to direct some of the traffic to follow an alternate path. • Add a direct circuit to divert traffic off this circuit. For example, if the Los Angeles to Chicago circuit is too busy, and a large fraction of the traffic on the circuit is destined for Atlanta, add a direct circuit from Los Angeles to Atlanta to offload that traffic. • Prioritize the traffic carried over the circuit, and use traffic shaping and policing to ensure high priority traffic gets through with minimal delay, at the cost of delaying the low priority traffic (or even discarding it). Entire books have been written on network design and redesign. To dig deeper, start with *Designing Wide Area Networks and Internetworks: A Practical Perspective*.[3]		
WAN	TOT, Discards Out % > 1%	15/60 min	Warning
Message:	**Too many discards out**		
Description:	When a queue grows, eventually the router, host, or switch will run out of buffers to hold the queued frames, and any additional frames that should be sent out the interface will be discarded. Discards are normal in IP networks because the TCP protocol is designed to drive the bottleneck link to saturation. The resulting congestion is then signaled back to the TCP sender as discarded (lost) packets. Too many discards lower the overall network efficiency, as the discarded packets must be resent.		

[3] Marcus, J. Scott, *Designing Wide Area Networks and Internetworks: A Practical Perspective*, Addison-Wesley, Reading, Mass, 1999, ISBN 0-201-69584-7.

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Recommendations:	• While most discards are due to queueing discards, there are other reasons a router may discard packets. Depending on the device, see if any of these other reasons may be causing discards. • If the link is over utilized, deal with it as described in the discussion of the Over Utilized alarms above. Note this may only move the bottleneck to another link. After increasing the speed, look to see if other links in the path are now seeing too many discards or are now over utilized. • Increase the number of buffers in the output queue. This is only appropriate if the link is not causing delay in the network, but is still discarding packets. If the link is causing significant delay, adding buffers can make it worse, without decreasing the discard rate significantly. • Implement RED (Random Early Discards) on the link. RED is a technique supported by many routers and switches to signal congestion to TCP flows before the queue fills. This has proven extremely effective in lowering discards, and improving overall network performance. However, if most of the traffic is based on UDP, or protocols other than TCP/IP protocols, RED may not affect them.		

4.2 WAN - Failure Profile

A single WAN failure profile is provided that applies to all WAN elements. It detects outright failures and too many errors, see Table 11.

Table 11 WAN – Failure

Element Type	Rule, Trend Variable, Threshold	Window	Severity
WAN	Availability	30 min	Critical
Message:	**Link Down**		
Description:	The link has gone down.		
Recommendations:	• Correct the problem. • If the link is normally down, you could disable polling to stop EHealth from polling and alarming on this link.		
WAN	TOT, Discards In % > 1%	15/60 min	Major
Message:	**Too many discards in**		

Description:	Too many frames were discarded after they were received.
	
	A frame going through a router or switch gets processed by three processes, a receiving process (frames in), a forwarding process, and a sending process (frame out). The frame (packet) can be discarded (lost) in any of the three processes.
	
	Packets lost in **sending** are generally lost due to queue losses (refer to the discussion of too many discards out in Table 10).
	Packets lost in **forwarding** are generally lost because the destination is unknown or unreachable.
	Packets lost in **receiving** (In frames) can be lost for a variety of reasons.
	• The receive process may not have enough buffers to hold the incoming frames.
	• The router or switch may use *input queueing* a technique where frames are buffered (queued) in the receiving interface hardware. Other designs are
	  • *shared memory* where a central memory is used to hold frames. In this design the receiving interface and sending interface access the shared memory to read and write the frames.
	  • *output queueing* where the frames are held in buffers in the sending interface.
	When a router or switch uses input queueing, if an outbound link is too busy, the input queues in the receiving interface fill up, and discard frames.		

Recommendations:	• Increase the amount of memory (buffers) allocated to the receiving interface. • If the router or switch uses input queueing, check the output interfaces to see which (if any) are too busy. If any are, solve that problem. • Check to see if there are any error conditions which may be causing this interface to discard frames.		
WAN	TOT, Errors % > 1%	15/60 min	Major
Message:	**Too many errors**		
Description:	Any frame which cannot be received or sent due to an error is counted here. If too many frames have errors (as measured as a percentage of total frames), the system performance will be degraded. Further, many errors are indicators of problems that may lead to failure of the link, interface, or router.		
Recommendations:	The kind of errors determine what may be wrong. *e*Health groups all errors together.		

4.3 WAN – Unusual Workload Profile

A single WAN unusual workload profile applies to all WAN elements. It detects when the workload on a link changes significantly.

This profile works best when applied to WAN links used by many users.

Table 12 WAN – Unusual Workload

Element Type	Rule, Trend Variable, Threshold	Window	Severity
WAN	• (DFM, Frames Out above 99.9 percentile) AND (PFM, Frames Out 10% above mean) • (DFM, Frames In above 99.9 percentile) AND (PFM, Frames In 10% above mean)	15/60 min	Warning
Message:	• **Unusually High Frames Out** • **Unusually High Frames In**		
Description:	The traffic as measured by the number of Frames In or Out, is unusually high. The rule requires at least a 10% increase in the number of frames/sec. Refer to section 12.1.		
Recommendations:	• Drilldown to a Trend report to see how the current data compares to the normal range. • Drilldown to an AAG report to diagnose the current values of a number of key variables for this WAN link. • If the Utilization In or Out is high, the WAN link may be causing delay, refer to the discussion in Table 10 for recommendations. • If the number of frames is Unusually High In and Out, and the Average Frame Size is small, the WAN link may be carrying an unusually high number of control frames. This may indicate a protocol problem. The Average Frame Size is a trend variable. • A new application or a new group of users may now be using this link. In these cases, the alarm should remain active for a long time.		
WAN	• (DFM, Frames Out below 99.9 percentile) AND (PFM, Frames Out 10% below mean) • (DFM, Frames In below 99.9 percentile) AND (PFM, Frames In 10% below mean)	15/60 min	Warning
Message:	• **Unusually Low Frames Out** • **Unusually Low Frames In**		
Description:	The traffic as measured by the number of frames In or Out, is unusually low. The rule requires at least a 10% increase in the number of frames/sec. Refer to section 12.1.		
Recommendations:	• Drilldown to a Trend report to see how the current data compares to the normal range. • Drilldown to an AAG report to diagnose the current values of a number of key variables for this WAN link. • If the traffic on the link is low during a period when the traffic is expected to be very predictable this may indicate a problem with an application. For example, every night at midnight, a file is transferred from a branch office to headquarters. Unusually low frames on the WAN link between the branch office and headquarters may indicate the file transfer failed. • If the alarm remains active for a long time, it could mean an application or a group of users are no longer using this link.		

5 Frame Relay Profiles

Frame Relay Ports are WAN Links and should be monitored with the appropriate WAN profiles. These profiles apply to Frame Relay circuits (DLCIs). Frame Relay circuits should have their speed set to Committed Information Rate (CIR).

Frame Relay circuits are used by enterprises to send data over the long distances (the WAN). They are purchased from a Frame Relay service provider, an organization that builds a Frame Relay network and sells bandwidth in the form of Frame Relay circuits to enterprises. Profiles are provided for the enterprise customer of Frame Relay services and for the service provider.

An **enterprise customer** of a Frame Relay circuit purchases a physical WAN serial link (often a T1 link) at each router to connect them to the Frame Relay network. These are called *access links*. The customer and the service provider set up a Frame Relay circuit over the two access links. A Frame Relay circuit is identified at each end of a link by a DLCI, a Data Link Circuit Identifier. Each access link can carry multiple Frame Relay circuits. It is very common for a customer of a Frame Relay service to buy a single link to attach a central router or switch located at corporate headquarters to a Frame Relay network. The headquarters access link carries many Frame Relay circuits, each leading to a different remote office.

The **service provider** provisions the Frame Relay network to connect the two ends of each circuit together. Frame relay circuits often are provisioned through multiple Frame Relay switches and are carried across multiple trunks within the Frame Relay network. The Frame Relay service provider lowers cost by selling the bandwidth of the trunks to carry circuits for many customers. Indeed, the Frame Relay service provider may over subscribe the trunk bandwidth.

Frame relay circuits have a CIR that is less than or equal to the speed of the underlying link to access the Frame Relay network. The CIR is measured in bits per second, and represents the largest average rate at which data is guaranteed to be delivered over the circuit. A user of a Frame Relay circuit can send traffic at a rate faster than CIR, however, the Frame Relay service provider does not guarantee the delivery of that portion of the data "over CIR". Since the cost of a Frame Relay circuit depends on the CIR purchased, some users feel data sent over CIR is "free" bandwidth.

When there is too much traffic through a switch or over a trunk within the Frame Relay network, the trunk or switch can become congested. When a trunk or switch is congested depends on the policies of the Frame Relay service provider and on the capabilities of the underlying switch. Different switches built by different vendors have different policies and techniques for identifying and responding to congestion. Customers of a Frame Relay service will have to contact their service provider for a precise definition of congestion. Because many circuits share trunks and switches, congestion on them can affect all customers, not just the circuits contributing the traffic that causes the congestion. Frame relay circuits are bi-directional (data can be sent in both directions), and the congestion may only affect traffic sent in one direction.

When a Frame Relay network is congested, it may send congestion notifications to the sender and receiver of the traffic. The congestion notification sent back to the sender is called a Backward Explicit Congestion Notification, or BECN. The congestion notification sent with the congested traffic to the receiver is called a Forward Explicit Congestion Notification, or FECN. These terms are defined from the point of view of the Frame Relay switches inside the Frame Relay network. For the customer of a Frame Relay service, receiving a BECN on a Frame Relay circuit indicates that the data that was sent over the circuit encountered congestion. The customer should respond by sending less traffic[4]. Receiving a FECN on a Frame Relay circuit indicates that the data that was received over the circuit encountered congestion. The customer should respond by having the far end of the circuit send less traffic.

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[4] At least that's what the Frame Relay specifications and the network service provider would like the user to do. But few routers or switches change their behavior in response to FECNs or BECNs.

One way a Frame Relay network can respond to congestion is to discard frames. One way to control which frames are discarded is to discard frames with the Discard Eligible (DE) flag set. The discard eligible flag can be set in two ways. The customer of the Frame Relay service could flag certain frames as discard eligible. The customer could flag frames over CIR as discard eligible, or the customer could prioritize traffic based on type, and flag lower priority traffic as discard eligible. Frame relay service providers can also flag frames as being discard eligible. Most often, this is done by the first Frame Relay switch inside the frame network receiving the traffic -- that is, the Frame Relay access switch where the access link from the customer terminates. If this access switch receives data at a rate over CIR from the customer it can respond in a number of ways:

1. It can simply let the frames into the network and do nothing.
2. It can flag some of the frames as discard eligible. This is known as *traffic marking*.
3. It can buffer (delay) frames, lowering the rate they are introduced into the network to lower the data rate to CIR. This is known as *traffic shaping*.
4. It can simply decide to discard enough frames to lower the data rate to CIR. This is known as *traffic policing*.

Traffic marking, shaping, or policing can be applied anywhere within the Frame Relay network.

5.1 Frame Relay for the Enterprise Profiles

Two profiles are provided for Frame Relay customers:

- Frame Relay for the Enterprise – Delay, see Table 13.
- Frame Relay for the Enterprise – Failure, see Table 14.

Table 13 Frame Relay for the Enterprise – Delay

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Frame Relay	TOT, Bandwidth Utilization In > 150% TOT, Bandwidth Utilization Out > 150%	15/60 min	Warning
Message:	**Over CIR in** **Over CIR out**		
Description:	This alarm indicates that the circuit is sending (out) or receiving (in) traffic significantly over CIR.		
Recommendations:	While traffic over CIR is not itself a problem, it may lead to increased delay in the Frame Relay network due to congestion within the Frame Relay network or because the Frame Relay network loses data. This alarm warns that data is at risk. The steps you can take to lower the bandwidth utilization are much the same as for any WAN link: • Increase the CIR of the circuit. • Reroute traffic. If you have a mesh network with redundant paths, you may be able to change the routing to direct some of the traffic to follow an alternate path. • Add a direct circuit to a divert traffic off this circuit. For example, if the Los Angeles to Chicago circuit is too busy, and a large fraction of the traffic on the circuit is destined for Atlanta, add a direct circuit from Los Angeles to Atlanta to offload that traffic. • Prioritize the traffic carried over the circuit, and use traffic shaping and policing to ensure high priority traffic gets through with minimal delay, at the cost of delaying the low priority traffic (or even discarding it). Entire books have been written on network design and redesign. To dig deeper, start with Scott Marcus' book "*Designing Wide Area Networks and Internetworks*".		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Frame Relay	TOT, BECN In % > 2%	15/60 min	Minor
Message:	**Congestion in network on outbound data sent**		
Description:	The Frame Relay network is indicating that it is congested on the data being sent by this host over the circuit to the other end.		
Recommendations:	• If this alarm persists without one of the two alarms listed below (Congestion in outbound data sent under CIR or Congestion in outbound data sent over CIR) being raised, then the traffic is encountering congestion, when it is sustaining traffic loads near CIR. Refer to section 5.2 for a description of recommended actions to take.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Frame Relay	TOT, BECN In % > 2% AND TOT, Bandwidth Utilization Out > 150%	15/60 min	Minor
Message:	**Congestion in network on outbound data sent over CIR**		
Description:	The Frame Relay network is indicating that it is congested on the data being sent by this host over the circuit to the other end, and when it is congested, the circuit is carrying traffic significantly **above** CIR.		
Recommendations:	• Refer to the general discussion of Frame Relay congestion in section 5.2 for a description of recommended actions to take.		
Frame Relay	TOT, BECN In % > 2% AND TOT, Bandwidth Utilization Out < 50%	15/60 min	Minor
Message:	**Congestion in network on outbound data sent under CIR**		
Description:	The Frame Relay network is indicating that it is congested on the data being sent by this host over the circuit to the other end, and when it is congested, the circuit is carrying traffic significantly **below** CIR.		
Recommendations:	• Refer to the general discussion of Frame Relay congestion in section 5.2 for a description of recommended actions to take.		
Frame Relay	TOT, FECN In % > 2%	15/60 min	Minor
Message:	**Congestion in network on inbound data received**		
Description:	The Frame Relay network is signaling that the traffic received on the circuit encountered congestion as it passed through the network from the sender.		
Recommendations:	• If this alarm persists without one of the two alarms listed below (Congestion in inbound data received under CIR or over CIR) being raised, then the traffic is encountering congestion, when it is sustaining traffic loads near CIR. Refer to the discussion in section 5.2 for a description of recommended actions to take.		
Frame Relay	TOT, FECN In % > 2% AND TOT, Bandwidth Utilization In > 150%	15/60 min	Minor
Message:	**Congestion in network on inbound data received over CIR**		
Description:	The Frame Relay network is signaling that the traffic received on the circuit encountered congestion as it passed through the network from the sender, and when the congestion was seen, the circuit was receiving traffic significantly above CIR.		
Recommendations:	• Refer to the general discussion of Frame Relay congestion in section 5.2 for a description of recommended actions to take.		
Frame Relay	TOT, FECN In % > 2% AND TOT, Bandwidth Utilization In < 50%	15/60 min	Minor
Message:	**Congestion in network on inbound data received under CIR**		
Description:	The Frame Relay network is signaling that the traffic received on the circuit encountered congestion as it passed through the network from the sender, and when the congestion was seen, the traffic was significantly below CIR.		
Recommendations:	• Refer to the general discussion of Frame Relay congestion in section 5.2 for a description of recommended actions to take.		

Table 14 Frame Relay for the Enterprise – Failure

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Frame Relay	Availability	30 min	Critical
Message:	**Frame Relay Circuit Down**		
Description:	The Frame Relay circuit is down.		
Recommendations:	• Check if the underlying WAN port access link is down. • Check to see if the far end router or WAN port access link is down. • Check to see if the Frame Relay circuit has been administratively turned off at either end. • If none of the above are true, then check with the Frame Relay service provider to see if there is a problem within their network.,		
Frame Relay	TOT, Errors % > 0.5%	15/60 min	Minor
Message:	**Too many errors**		
Description:	The Frame Relay circuit has encountered errors. Most errors occur when a frame is being sent or received over the Frame Relay circuit. Errors when a frame is sent often occur because of problems within the sending interface. Errors when a frame is received could indicate problems in the receiving interface, or it could represent CRC errors where the frame is corrupted within the Frame Relay network.		
Recommendations:	• Determine the kinds of errors the circuit is experiencing and correct them.		

5.2 Diagnosing Congestion Problems in Frame Relay Circuits

Congestion problems in Frame Relay circuits can be difficult to diagnose. When an alarm indicates that a circuit is congested, there are a number of things to check:

1. Which direction is encountering congestion? The profile distinguishes between congestion encountered in each direction.
2. What traffic (bandwidth utilization) is the circuit carrying when the congestion is encountered? This profile identifies three cases: when traffic is over CIR or under CIR when congestion occurs, and when neither are true, meaning traffic roughly equals CIR when congestion occurs.
3. Where is the congestion occurring? At the sending access link, at the receiving access link, or internally within the network.
   a) You can identify if an access link is over utilized by examining the bandwidth utilization in and the bandwidth utilization out of the WAN port.

For example, say a circuit carrying traffic from Atlanta to Boston is showing alarms at each end. You see **Congestion in network on outbound data sent** at the Atlanta end of the circuit, and **Congestion in network on inbound data received** at the Boston end of the circuit. These alarms are consistent, and indicate congestion in the traffic sent from Atlanta to Boston.

The circuit has a CIR of 128 Kbit/sec, and the access lines in both ends are T1 (1.544 Mbit/sec) links. While the Atlanta Access link carries only the single circuit, the Boston access link carries 10 circuits.

The Atlanta-Boston circuit is carrying about 140 Kbit/sec of traffic from Atlanta to Boston. The Bandwidth Utilization Out measured at Atlanta is only 9% of the port's speed. Clearly, the access port out of Atlanta is not the source of the congestion.

However the circuit has a Bandwidth Utilization of about 110%, which means the circuit is being given traffic slightly above CIR. This could be why the network is indicating congestion.

The Bandwidth Utilization In on the Frame Relay circuit at Boston is also about 110% (140 Kbit/sec). So we aren't losing much of the traffic.

But the total Bandwidth Utilization In of the T1 port in Boston for the access link carries about 1.250 Mbit/sec traffic for 10 Frame Relay circuits, and its Bandwidth Utilization In is about 81%. This link may well be the source of the congestion. The traffic may getting through the Frame Relay network, only to encounter congestion at the outbound access link. The three Delay – WAN profiles for 56K, T1, and T3 will raise an alarm when the access port is over utilized, and will distinguish between inbound and outbound directions.

With answers to those three questions, here are recommended actions for many of the cases.

1. If either access link is over utilized, then fix the over utilization as described in section 4.1 and Table 10.
2. If neither access link is over utilized, and the traffic on the Frame Relay circuit is significantly less than CIR, then the congestion may be within the network, and not directly caused by your traffic.
   a) Check with your network service provider to see if there is a congestion problem within the network.
3. If the traffic is significantly greater than CIR, then the congestion may be specific to this circuit.
   a) Increase the CIR of this circuit. A Trend report of bandwidth utilization should show how much bandwidth (CIR) is needed.
   b) Reroute traffic off from this circuit. If you have a mesh network with redundant paths, you may be able to change the routing to direct some of the traffic to follow an alternate path.
   c) Add a direct circuit to divert traffic off this circuit. For example, if the Los Angeles to Chicago circuit is too busy, and a large fraction of the traffic on the circuit is destined for Atlanta, add a direct circuit from Los Angeles to Atlanta to offload that traffic.
   d) If you have installed at probe at either end of the circuit, use Traffic Accountant reports to determine which application, and nodes are using the circuit most.
   e) Prioritize the traffic carried over the circuit, and use traffic shaping or policing to ensure high priority traffic gets through with minimal delay, at the cost of delaying the low priority traffic (or even discarding it).
   f) Add another circuit to carry the different traffic flows.
4. If the traffic roughly equals CIR (that is neither case 2 nor case 3 are true) then any of the above actions may help.

5.3 Frame Relay for the Service Provider Profiles

The Frame Relay service provider must balance the requirements of many customers and ensure that all customers receive the service levels for which they contract. While the service provider has more tools at its disposal to measure and control delay and failures; the errors, discards, and latency introduced by each Frame Relay switch accumulate for all the switches through which a circuit passes. The service provider profiles account for this by using slightly lower thresholds than the enterprise profiles.

The two service provider profiles are:

- Frame Relay for the Service Provider – Delay, see Table 15.
- Frame Relay for the Service Provider – Failure, see Table 16.

Table 15 Frame Relay for the Service Providers – Delay

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Frame Relay	TOT, Bandwidth Utilization In > 150% TOT, Bandwidth Utilization Out > 150%	15/60 min	Minor
Message:	**Over utilized in** **Over utilized out**		
Description:	The traffic on this circuit is well over Committed Information Rate (CIR), either inbound or outbound to the frame relay switch. If this circuit is an access circuit, then • Over Utilized In indicates the traffic received from the customer is over CIR, while • Over Utilized Out indicates the traffic sent to the customer is over CIR.		
Recommendations:	• If the traffic is consistently over CIR, the customer may wish to increase the CIR of the circuit. • For Over Utilized In on an access circuit, consider applying traffic policing or traffic shaping to control the overload.		
Frame Relay	TOT, BECN In % > 2%	15/60 min	Minor
Message:	**Backward congestion received from downstream**		
Description:	The switch has received backward congestion indications (BECNs) from the downstream switch. These BECNs will be sent back upstream to the next switch closer to the sender.		
Recommendations:	• If this is an internal trunk, one of the switches downstream (towards the receiver of the data) is congested. • If this is a NNI (Network Network Interface) connection to another Frame Relay network, then the congestion is in the network on the other side of the NNI. Forward the problem to the other network provider for resolution.		
Frame Relay	TOT, BECN Out % > 2%	15/60 min	Minor
Message:	**Backward congestion sent upstream to sender**		
Description:	The switch has sent BECNs, backward congestion indications, upstream on this circuit, towards the sender of the data that is congested. The BECNs sent combine both BECNs received from downstream and any congestion indications generated within this switch.		
Recommendations:	• Determine if the BECNs are internally generated or simply passed on by this switch. • Examine the BECNs received on the circuit this circuit is cross connected to within the switch. • If they are comparable to the BECNs Out on this circuit, then trace the circuit downstream to find out where the congestion is occurring. • If the BECNs Out on this circuit are more than the BECNs received on the cross-connect circuit, then there is congestion within this switch. The rules for determining when a circuit is congested vary with different switch manufacturers using different rules. • Examine the outbound utilization of the port carrying the circuit to which this circuit is cross-connected. If the outbound utilization of that port is high, then the queues will grow, and all the traffic carried on that network interface will be delayed and congested. The port should be showing alarms. Most of the circuits carried over this port should also show alarms as well.		
Frame Relay	TOT, FECN In % > 2%	15/60 min	Minor
Message:	**Forward congestion received from upstream**		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Description:	The switch has received congestion indications (FECNs) from the upstream switch. This indicates that the traffic was congested upstream (closer to the sender). These FECNs will be passed on downstream.		
Recommendations:	• If this network interface is an NNI, an interface to another network, the congestion was within that other network. Forward the problem to the other network for resolution. • If the interface is an internal trunk, then trace the circuit back upstream to find the source of the congestion.		
Frame Relay	TOT, FECN Out % > 2%	15/60 min	Minor
Message:	**Forward congestion sent downstream to receiver**		
Description:	The switch has sent FECNs downstream to the receiver of the data indicating congestion. The FECNs sent combine the FECNs received from upstream with those locally generated within the switch.		
Recommendations:	• Determine if the FECNs are internally generated or simply passed on by this switch. • Examine the FECNs received on the circuit this circuit is cross connected to within the switch. • If they are comparable to the FECNs Out on this circuit, then trace the circuit upstream to the next switch to find out where the congestion is occurring. • If the FECNs Out on this circuit are more than the FECNs received on the cross connect circuit, then the congestion is within this switch. The rules for determining when a circuit is congested vary with different switch manufacturers using different rules. • Examine the outbound utilization of the port carrying this circuit. If the outbound utilization of that port is high, then the queues will grow, and all the traffic carried on that network interface will be delayed and congested. The port should be showing alarms. Most of the circuits carried over this port should also show alarms as well.		
Frame Relay	TOT, Discards % > 1%	15/60 min	Minor
Message:	**Too many discards**		
Description:	When a queue grows, eventually the Frame Relay switch will run out of buffers to hold the queued frames, and any additional frames that should be sent out the interface will be discarded. Discards are normal in IP networks because the TCP protocol is designed to drive the bottleneck link to saturation. The resulting congestion is then signaled back to the TCP sender as discarded (lost) packets. Too many discards lower the overall network efficiency, as the discarded packets must be resent.		
Recommendations:	While most discards are due to queueing discards, there are other reasons a Frame Relay switch may discard packets. Depending on the switch, see if any of these other reasons may be causing discards: • If the link is over utilized, deal with it as described above. Note this may only move the bottleneck to another link. After increasing the speed, look to see if other links in the path are now seeing too many discards or are now over utilized. • Increase the number of buffers in the output queue. This is only appropriate if the link is not causing delay in the network, but is still discarding packets. If the link is causing significant delay, adding buffers can make it worse, without decreasing the discard rate significantly.		

Table 16 Frame Relay for the Service Provider – Failure

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Frame Relay	Availability	30 min	Critical
Message:	**Frame Relay Circuit Down**		
Description:	The Frame Relay circuit is down.		
Recommendations:	• Check to see if the WAN port carrying the Frame Relay circuit is down. • Check to see if the adjacent switch or the WAN port on the other end of the link is down. • Tracing the circuit, see if any other switch or link is down. • Check to see if either customer router or LAN switch is down, or if either access link is down. • If the circuit will be down for an extended period, you could temporarily turn off polling for the circuit.		
Frame Relay	TOT, Errors % > 0.5%	15/60 min	Minor
Message:	**Too many errors**		
Description:	The Frame Relay circuit has encountered errors. Most errors occur when a frame is being sent or received over the Frame Relay circuit. Errors when a frame is sent often occur because of problems within the sending interface. Errors when a frame is received could indicate problems in the receiving interface, or it could represent CRC errors where the frame is corrupted on the link.		
Recommendations:	• Determine the kinds of errors the circuit is experiencing, and correct them.		

5.4 Frame Relay - Unusual Workload Profiles

Table 17 Frame Relay – Unusual Workload

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Frame Relay	DFM, Frames Out (/sec) above 99.9 percentile DFM, Frames In (/sec) above 99.9 percentile	15/60 min	Warning
Message:	**Unusually High Frames Out** **Unusually High Frames In**		
Description:	The traffic as measured by the number of Frames In or Out is unusually high.		
Recommendations:	• Drilldown to a Trend report to see how the current data compares to the normal range. • Drilldown to an AAG report to diagnose the current values of a number of key variables for this WAN link. • If the Utilization In or Out is high, the WAN link may be causing delay. Refer to the discussion in Table 10 for recommendations. • If the number of frames is unusually high In and Out, and the Average Frame Size is small, the WAN link may be carrying an unusually high number of control frames. This may indicate a protocol problem. The Average Frame Size is a trend variable. • A new application or a new group of users may now be using this link. In these cases, the alarm should remain active for a long time.		

6 ATM Profiles

ATM services can be used to provide a WAN link between routers or switches in different sites. ATM can also be used within a campus to connect LANs together. When ATM is used for WAN links, an Enterprise that uses the service buys the service (the link) from an ATM service provider. ATM profiles are provided for both the Enterprises who use the ATM service, and the ATM Service Provider. The Service Provider profile could be used at the provider's edge ATM switch where the traffic is initially received and policed, or inside the core of the network to monitor ports for excessive causes of delay (over utilized links, traffic out of spec, too many discards, etc.).

When ATM is used within a campus, the Enterprise purchases and manages their own ATM switches.

6.1 ATM for the Enterprise Profiles

Three profiles are provided for Enterprise customers; they apply to routers or switches that access an ATM service network. These profiles are also appropriate for LAN switches or routers connected to campus ATM switches.

- ATM for the Enterprise T1 – Delay, see Table 18, is appropriate for T1/E1 links, and the paths and channels they carry.
- ATM for the Enterprise T3 – Delay, see Table 18, is appropriate for T3 or faster links, and the paths and channels they carry.
- ATM for the Enterprise – Failure, see Table 19, is appropriate for all ATM ports, paths, and channels.

**Table 18 ATM for the Enterprise T1 – Delay,
ATM for the Enterprise T3 – Delay**

Element Type	Rule, Trend Variable, Threshold	Window	Severity
ATM Port	TOT, Bandwidth Utilization In > *x*% TOT, Bandwidth Utilization Out > *x*%	15/60 min	Minor
Message:	**Over Utilized In** **Over Utilized Out**		
Description:	The ATM Port is carrying too much traffic In or Out. As traffic builds on an outbound link, when a frame arrives that is to be sent on that link, it will be queued until the link becomes free. Since each frame must wait for the frames queued in front of it to be serviced, longer queues add more delay to the latency of the packet. The faster the link, the higher the utilization that can be supported. Profiles for two speed ranges are supplied, T1 and T3. The **T1** profile supports T1/E1 ATM ports and the paths and circuits they carry. I.e., ports whose speed is 1.544 Mbps or 2.048 Mbps. Here *x* = 75%. The **T3** profile is for T3/E3, and higher speed ports like OC3, OC12, and beyond and the paths and circuits they carry, here *x* = 90%.		
Recommendations:	• Get a faster port, for example, upgrade a T1 to a T3. • Setup up a parallel circuit, and split the traffic equally between the two circuits. • Reroute traffic, if you have a mesh network with redundant paths, you may be able to change the routing to direct some of the traffic to follow an alternate path. • Add a direct circuit to a divert traffic off this circuit. For example, if the Los Angeles to Chicago circuit is too busy, and a large fraction of the traffic on the circuit is destined for Atlanta, add a direct circuit from Los Angeles to Atlanta to offload that traffic. • Prioritize the traffic carried over the circuit, and use traffic shaping and policing to ensure high priority traffic gets through with minimal delay, at the cost of delaying the low priority traffic (or even discarding it). Entire books have been written on network design and redesign. To dig deeper, start with Scott Marcus' book "*Designing Wide Area Networks and Internetworks*"[3].		
ATM Port	TOT, Discarded Cells Out % > 0.5%	15/60 min	Warning
Message:	**Too many discarded cells out**		
Description:	When a queue grows, eventually the router, host, or switch will run out of buffers to hold the queued cells, and any additional cells that should be sent out the interface will be discarded. Discards are normal in IP networks because the TCP protocol is designed to drive the bottleneck link to saturation. The resulting congestion is then signaled back to the TCP sender as discarded (lost) packets. Too many discards lower the overall network efficiency, as the discarded packets must be resent. For ATM networks carrying IP data, loss of a single cell means the whole frame is lost. ATM networks carrying other kinds of data (Voice, Video, Switched SNA traffic) may be more or less sensitive to discarded cells. For example, Voice is less sensitive to discards, as an occasional lost cell can be tolerated.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Recommendations:	While most discards are due to queueing discards, there are other reasons a router or switch may discard cells. Depending on the device, see if any of these other reasons may be causing discards: • If the link is over utilized, deal with it as described above in the **Over Utilized** alarm. Note this may only move the bottleneck to another link. If the speed is increased, look to see if other links in the path are now seeing too many discards or are now over utilized. • Increase the number of buffers in the output queue. This is only appropriate if the link is not causing delay in the network, but is still discarding packets. If the link is causing significant delay, adding buffers can make it worse, without decreasing the discard rate significantly.		
ATM Port	TOT, CLP1 Cells In % > 10%	15/60 min	Warning
Message:	**Too many CLP1 cells in**		
Description:	ATM networks can mark cells based on their priority, the cell's priority is in the CLP (Cell Loss Priority) field, a single bit. If the CLP bit is 0, the cell has higher priority than cells where the CLP bit is 1. Cells with CLP = 1 should be discarded in preference to cells with CLP = 0. The ATM network can mark cells with CLP = 1 when they violate the traffic policies of the network, or when the ATM network is congested.		
Recommendations:	Determine where the cells are being marked, and why: • Is this ATM port's Bandwidth Utilization In too high? If it is, the ATM network may be indicating congestion on its end of the ATM link. • Is one or more of the ATM circuits carried by this port violating its traffic policy? For example, an ATM circuit has been purchased with a CBR (Constant Bit Rate) service. But the circuit is actually being used for data traffic and the sending router or switch is treating the circuit as a UBR (Unspecified Bit Rate) circuit. Then it is likely the traffic will violate the traffic policy, and the network may mark the offending cells with CLP = 1. The receiving Port will see the CLP = 1 cells. • Is there congestion inside the ATM network? The ATM circuits coming in over this port likely share bandwidth with other circuits on links inside the ATM network. If the aggregate traffic from those circuits sharing a link overuse the link's bandwidth, you may see it as cells received with CLP = 1.		
ATM Channel	TOT, Bandwidth Utilization Out > 100% TOT, Bandwidth Utilization In > 100%	15/60 min	Warning
Message:	**Traffic in over SCR** **Traffic out over SCR**		
Description:	When an Enterprise customer of an ATM service buys a channel from a service provider, they may purchase a particular capacity in terms of the Sustainable Cell Rate, or SCR. This is the maximum bit rate that a user can offer to the service over a long period and have all of the cells carried. It is generally less than or equal to Peak Cell Rate, which is the maximum rate at which cells can be offered for a short period and still be carried. eHealth attempts to determine the SCR when the channel is discovered, and sets the speed to the SCR (as measured in bits/sec). This alarm is raised when the traffic in or out an ATM channel is above the SCR for more than 15 minutes out of the past hour. When the traffic is above the SCR, the ATM service may discard or delay cells.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Recommendations:	• Check to see if the speed is correctly set to the SCR of the circuit. If the SCR is higher (or lower), correct the speed in the poller configuration. • Purchase an increased SCR from the ATM service provider. • Reroute traffic. If you have a mesh network with redundant paths, you may be able to change the routing to direct some of the traffic to follow an alternate path. • Add a direct circuit to a divert traffic off this circuit. For example, if the Los Angeles to Chicago circuit is too busy, and a large fraction of the traffic on the circuit is destined for Atlanta, add a direct circuit from Los Angeles to Atlanta to offload that traffic. • Prioritize the traffic carried over the circuit, and use traffic shaping and policing to ensure high priority traffic gets through with minimal delay, at the cost of delaying the low priority traffic (or even discarding it). Entire books have been written on network design and redesign. To dig deeper, start with *Designing Wide Area Networks and Internetworks: A Practical Perspective.*[3]		
ATM Channel	TOT, AAL5 PDUs Discarded % > 1%	15/60 min	Warning
Message:	**Too many AAL5 frames discarded**		
Description:	ATM Channels used to carry IP traffic or to carry frames between LAN switches in a campus, often carry those frames using AAL5. Since frames are larger than cells, AAL5 fragments a frame into multiple cells. The loss of any of those cells causes the entire frame to be discarded. It may be discarded at the ATM switch or ATM access device (the router or switch that connects to the ATM service). If a cell is lost due to an error, the entire AAL5 frame will be discarded if the ATM switch implements Partial Packet Discard (PPD). If a cell is lost due to congestion, or traffic policing actions causing cells to be discarded, the switch will discard all the following cells in that frameif the switch implements Early Packet Discard (EPD).		
Recommendations:	• Determine why cells are being discarded, and correct that problem. Note that a few cells discarded (1 in 1000) could easily cause 2% of the frames to be lost if a frame is fragmented into 20 cells. • While most discards are due to queueing discards, there are other reasons a switch may discard cells. Depending on the device, see if any of these other reasons may be causing discards. • If the link is over utilized, deal with it as described in the discussion of the Over utilized alarm above. Note this may only move the bottleneck to another link. After increasing the speed, look to see if other links in the path are now seeing too many discards or are now over utilized. • Increase the number of buffers in the output queue. This is only appropriate if the link is not causing delay in the network, but is still discarding packets. If the link is causing significant delay, adding buffers can make it worse, without decreasing the discard rate significantly.		

Table 19 ATM for the Enterprise – Failure

Element Type	Rule, Trend Variable, Threshold	Window	Severity
ATM Port	Availability	30 min	Critical
Message:	**ATM Port Down**		
Description:	The ATM Port is down.		
Recommendations:	• Check to see if the problem is with this end of the link, or the other end.		
ATM Port	TOT, Errored Seconds > 5 sec	15/60 min	Minor
Message:	**Too many seconds with errors**		
Description:	The ATM port measures the number of seconds that have had errors in them. This alarm is raised if more than 5 seconds out of a poll period (typically 5 minutes) has errors, and the poll periods total more than 15 minutes out of the past hour.		
Recommendations:	• Determine the kinds of errors included in the computation of errored seconds supported by the switch. Correct those problems.		
ATM Port	TOT, Severely Errored Seconds > 0 sec	15/60 min	Major
Message:	**Too many seconds with severe errors**		
Description:	The ATM port measures the number of seconds that have been severely errored. There is a standard definition of severely errored seconds for SONET/SDH and DS1/DS3 physical links.		
Recommendations:	• Any severely errored seconds are a serious problem, and can lead to lost connections and link down.		
ATM Port	TOT, Unavailable Seconds > 0 sec	5/60 min	Critical
Message:	**Too many unavailable seconds**		
Description:	An unavailable second is a second where the link is unusable.		
Recommendations:	• An unavailable second without the link going down indicates an intermittent problem on the link that should be corrected.		
ATM Path	Availability	30 min	Critical
Message:	**ATM Path down**		
Description:	The ATM path is down. Since paths can carry multiple channels, this could indicate the failure of a number of channels.		
Recommendations:	• Determine if the ATM port carrying the path is down. • See if the far end of the circuit is down. • Check to see if there is a problem within the ATM network.		
ATM Channel	Availability	30 min	Critical
Message:	**ATM Channel Down**		
Description:	An ATM cannel is down.		
Recommendations:	• Check to see if the underlying port or path is down. • See if the far end of the circuit is down. • Check to see if there is a problem within the ATM network.		

6.2 ATM Service Provider Profiles

Three profiles are provided for ATM service providers; they apply to the ATM ports, paths and channels on the ATM switches in the network.

- ATM for the Service Provider T1 – Delay, Table 20, is appropriate for T1/E1 links, and the paths and channels they carry.
- ATM for the Service Provider T3 – Delay, Table 20, is appropriate for T3 or faster links, and the paths and channels they carry.
- ATM for the Service Provider – Failure, Table 21, is appropriate for all ATM ports, paths, and channels.

Table 20 Delay – ATM for the Service Provider T1
Delay – ATM for the Service Provider T3

Element Type	Rule, Trend Variable, Threshold	Window	Severity
ATM Port	TOT, Bandwidth Utilization Out > *x* % TOT, Bandwidth Utilization In > *x* %	15/60 min	Minor
Message:	**Over utilized out** **Over utilized in**		
Description:			
Recommendations:	•		
ATM Port	TOT, Discarded Cells Out % > 0.5% TOT, Discarded Cells In % > 0.5%	15/60 min	Minor
Message:	**Too many discarded cells out** **Too many discarded cells in**		
Description:			
Recommendations:	•		
ATM Port	TOT, CLP1 Cells Out (%) > 10% TOT, CLP1 Cells In (%) > 10%	15/60 min	Minor
Message:	**Too many CLP1 frames out** **Too many CLP1 frames in**		
Description:			
Recommendations:	•		
ATM Port	TOT, CLP0 Discards Out % > 0.1%	15/60 min	Minor
Message:	**Too many CLP0 frames discarded**		
Description:			
Recommendations:	•		
ATM Port	TOT, Policy Violations In % > 10% TOT, Policy Violations Out % > 10%	15/60 min	Minor
Message:	**Too many policy violations in** **Too many policy violations out**		
Description:			
Recommendations:	•		
ATM Path	TOT, Bandwidth Utilization Out > 100% TOT, Bandwidth Utilization In > 100%	15/60 min	Minor
Message:	**Over utilized out** **Over utilized in**		
Description:			
Recommendations:	•		
ATM Path	TOT, CLP1 Cells % > 10%	15/60 min	Minor
Message:	**Too many CLP1 frames**		
Description:			
Recommendations:	•		
ATM Path	TOT, Discarded Cells In % > 0.5%	15/60 min	Minor
Message:	**Too many discarded cells out**[5]		
Description:			
Recommendations:	•		
ATM Path	TOT, CLP0 Discards % > 0.1%	15/60 min	Minor
Message:	**Too many CLP0 frames discarded**		
Description:			
Recommendations:	•		

[5] Probable bug, message is "out" variable is "in", something is messed up.

Element Type	Rule, Trend Variable, Threshold	Window	Severity
ATM Channel	TOT, Bandwidth Utilization Out > 100% TOT, Bandwidth Utilization In > 100%	15/60 min	Minor
Message:	**Traffic out over SCR** **Traffic in over SCR**		
Description:			
Recommendations:	•		
ATM Channel	TOT, Discarded Cells Out % > 0.5% TOT, Discarded Cells In % > 0.5%	15/60 min	Minor
Message:	**Too many discarded cells out** **Too many discarded cells in**		
Description:			
Recommendations:	•		
ATM Channel	TOT, CLP1 Cells In (%) > 10%	15/60 min	Minor
Message:	**Too many CLP1 frames in**		
Description:			
Recommendations:	•		
ATM Channel	TOT, CLP0 Discards Out % > 0.1%	15/60 min	Minor
Message:	**Too many CLP0 frames discarded**		
Description:			
Recommendations:	•		

Table 21 ATM for the Service Provider – Failure

Element Type	Rule, Trend Variable, Threshold	Window	Severity
ATM Port	Availability	30 min	Critical
Message:	**ATM Port Down**		
Description:	The ATM Port is down.		
Recommendations:	• Check to see if the problem is with this end of the link, or the other end.		
ATM Port	TOT, Errored Seconds > 5 sec	15/60 min	Minor
Message:	**Too many seconds with errors**		
Description:	The ATM port measures the number of seconds that have had errors in them. This alarm is raised if more than 5 seconds out of a poll period (typically 5 minutes) has errors, and the poll periods total more than 15 minutes out of the past hour. This is a standard measure of errors on ATM links.		
Recommendations:	• Determine the kinds of errors included in the computation of errored seconds supported by the switch. Correct those problems.		
ATM Port	TOT, Severely Errored Seconds > 0 sec	15/60 min	Major
Message:	**Too many seconds with severe errors**		
Description:	The ATM port measures the number of seconds that have been severely errored. There is a standard definition of severely errored seconds for SONET/SDH[6] links.		
Recommendations:	• Any severely errored seconds are a serious problem, and can lead to lost connections and link down.		
ATM Port	TOT, Unavailable Seconds > 0 sec	5/60 min	Critical
Message:	**Too many unavailable seconds**		
Description:	An unavailable second is a second where the link is unusable.		
Recommendations:	• An unavailable second without the link going down indicates an intermittent problem on the link that should be corrected.		
ATM Path	Availability	30 min	Critical
Message:	**ATM Path down**		
Description:	The ATM path is down. Since paths can carry multiple channels, this could indicate the failure of a number of channels.		
Recommendations:	• Determine if the ATM port carrying the path is down.		
ATM Channel	Availability	30 min	Critical
Message:	**ATM Channel Down**		
Description:	An ATM cannel is down.		
Recommendations:	• Check to see if the underlying port or path is down. • See if the far end of the circuit is down. • Check to see if there is a problem within the ATM network.		

6.3 ATM – Unusual Workload Profiles

The ATM – Unusual Workload profile is appropriate for all kinds of ATM ports, paths, and channels.

[6] Anyone know if there's a standard definition for severely errored seconds?

Table 22 ATM - Unusual Workload

Element Type	Rule, Trend Variable, Threshold	Window	Severity
ATM Port	• (DFM, Cells In above 99.9 percentile) AND (TOT, Bandwidth In > 25%) • (DFM, Cells Out above 99.9 percentile) AND (TOT, Bandwidth In > 25%)	15/60 min	Warning
Message:	• **Unusually high cells in** • **Unusually high cells out**		
Description:	The number of cells in or out are unusually high. The rule alarms only if the bandwidth utilization on the port is over 25%. Refer to section 12.1.		
Recommendations:	• Drilldown to a Trend report to see how the current data compares to the normal range. • Drilldown to an AAG report to diagnose the current values of a number of key variables for this ATM Port. • If the Utilization In or Out is high, the Port may be causing delay, refer to the discussion in Table 18 for the Over Utilized alarms for recommendations. • A new application or a new group of users may now be using this link. In these cases, the alarm should remain active for a long time.		
ATM Path	• (DFM, Cells In above 99.9 percentile) AND (TOT, Bandwidth In > 25%) • (DFM, Cells Out above 99.9 percentile) AND (TOT, Bandwidth In > 25%)	15/60 min	Warning
Message:	• **Unusually high cells in** • **Unusually high cells out**		
Description:	The number of cells in or out are unusually high. The rule alarms only if the bandwidth utilization on the path is over 25%. Refer to section 12.1.		
Recommendations:	• Drilldown to a Trend report to see how the current data compares to the normal range. • Drilldown to an AAG report to diagnose the current values of a number of key variables for this ATM Path. • If the Utilization In or Out is high, the Path may be causing delay, refer to the discussion in **Error! Reference source not found.** for recommendations. • A new application or a new group of users may now be using this link. In these cases, the alarm should remain active for a long time.		
ATM Channel	• (DFM, Cells In above 99.9 percentile) AND (TOT, Bandwidth In > 25%) • (DFM, Cells Out above 99.9 percentile) AND (TOT, Bandwidth In > 25%)	15/60 min	Warning
Message:	• **Unusually high cells in** • **Unusually high cells out**		
Description:	The number of cells in or out are unusually high. The rule alarms only if the bandwidth utilization on the channel is over 25%. Refer to section 12.1.		
Recommendations:	• Drilldown to a Trend report to see how the current data compares to the normal range. • Drilldown to an AAG report to diagnose the current values of a number of key variables for this ATM Channel. • If the Utilization In or Out is high, the Channel may be causing delay, refer to the discussion in **Error! Reference source not found.** for recommendations. • A new application or a new group of users may now be using this channel. In these cases, the alarm should remain active for a long time.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
ATM Channel	• (DFM, AAL5 PDUs In above 99.9 percentile) AND (TOT, Bandwidth In > 25%) • (DFM, AAL5 PDUs Out above 99.9 percentile) AND (TOT, Bandwidth In > 25%)	15/60 min	Warning
Message:	• **Unusually high AAL5 PDUs in** • **Unusually high AAL5 PDUs out**		
Description:	The number of AAL5 PDUs in or out are unusually high. The rule alarms only if the bandwidth utilization on the channel is over 25%. Refer to section 12.1.		
Recommendations:	• Drilldown to a Trend report to see how the current data compares to the normal range. • Drilldown to an AAG report to diagnose the current values of a number of key variables for this ATM Channel. • If the Utilization In or Out is high, the Channel may be causing delay, refer to the discussion in **Error! Reference source not found.** for recommendations. • A new application or a new group of users may now be using this channel. In these cases, the alarm should remain active for a long time.		

7 Router and Switch Profiles

Three profiles are provided for routers and switches. All three apply to any kind of router or switch:

- Router or Switch – Delay, see Table 23
- Router or Switch – Failure, see Table 24
- Router or Switch – Unusual Workload, see Table 25

7.1 Router or Switch – Delay Profile

Table 23 Router or Switch – Delay

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Router, Router with CPU	TOT, Average Line Utilization > 70%	15/60 min	Major
Message:	**Interfaces too busy**		
Description:	The interfaces on this router are, in aggregate, too busy. Average Line Utilization is measured by summing the Bandwidth Utilization of each polled interface on the router, and dividing by the number of polled interfaces. If the router or switch has interfaces of widely different speeds this alarm won't detect problems where the slow speed links are too busy. For example, an Ethernet LAN interface with a utilization of 2% and a 56K WAN link with a utilization of 90%, the Router will have an average interface utilization of only 46%. To detect problems with the low speed links, the interfaces should be discovered as LAN/WAN interfaces, the interfaces should be placed in the appropriate groups, and the groups should be monitored with the appropriate profiles.		
Recommendations:	• The interfaces on this router are seriously over used. Many of the interfaces should be upgraded in speed, or the traffic on the interfaces should be reduced. • If you are not monitoring the individual interfaces, you should do so now.		
Router, Router with CPU	TOT, Average Packet Discards > 5%	15/60 min	Major
Message:	**Too many discards**		
Description:	The router is discarding too many packets. The average packet discards is the sum of the discards % for the polled interfaces, divided by the number of polled interfaces.		
Recommendations:	• Drilldown to an AAG report for the router or switch to diagnose the router and see if there are related problems. • While most discards are due to queueing discards, there are other reasons a router may discard packets. Depending on the device, see if any of these other reasons may be causing discards. • If the interfaces are over utilized, deal with them as described above. • Increase the number of buffers in the output queue. This is only appropriate if the router is not causing delay in the network, but is still discarding packets. If the router is causing significant delay, adding buffers can make it worse, without decreasing the discard rate significantly. • Implement RED (Random Early Discards) on the router. RED is a technique supported by many routers and switches to signal congestion to TCP flows before the queue fills. This has proven extremely effective in lowering discards, and improving overall network performance. However, if most of the traffic is based on UDP, or protocols other than TCP/IP protocols, RED may not affect them.		
Switch Plus Backplane	TOT, Backplane Utilization > 50%	15/60 min	Major
Message:	**Backplane over utilized**		
Description:	The switch backplane utilization is too high. When the backplane is too busy, the switch will delay a packet as it is transferred from the receiving interface to the interface the frame should be forwarded out. The backplane is the central bottleneck through which all packets must pass.		
Recommendations:	• Lower the traffic through the switch, either by rerouting traffic around the switch, or by cutting the number of users it supports. • Upgrade the switch to one with a faster backplane.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Router CPU, Switch CPU	TOT, CPU Utilization > 60%	15/60 min	Major
Message:	**CPU too busy**		
Description:	The CPU utilization is too high. When the CPU is too busy, frames may be delayed as the CPU cannot quickly decide how to forward this frame. Other functions performed by the CPU, such as processing routing updates may be delayed as well.		
Recommendations:	• Review the functions being performed in the router. Is it performing extra processing that may not be needed? For example, is the router performing extra filtering on each packet? • Some routers allow the CPU to be replaced with a faster processor. Other routers allow additional processors to be added. • Upgrade the router to a newer, faster, router.		

7.2 Router or Switch – Failure Profile

Table 24 Router or Switch – Failure

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Router, **Router with CPU**	Availability	30 min	Critical
Message:	**Router Down**		
Description:	The router went down. Note that eHealth cannot be sure the router was actually down until it has come back up. Refer to the general discussion in 12.4 Availability and Reachability Alarms for Hosts.		
Recommendations:	•		
Router, **Router with CPU**	Reachability	30 min	Critical
Message:	**Router unreachable**		
Description:	The router is unreachable, and may be down Network problems may also prevent the poller from reaching the router's IP Address.		

Recommendations:	• Check to see if the device can be reached (for example, by sending a number of pings to the device).
	• Check if other routers between the eHealth console and the router are down.
	• If the router is up, and the reachability alarm persists, check the latency to the router. If it is often high, eHealth may be seeing timeouts on the ping.
	  • The problem could be that the latency to the router is too high. Fix the network latency problem.
	  • The problem could be that the eHealth ping timeout is set to low. Increase the ping timeout used by eHealth.		

Router, **Router with CPU**	TOT, Errors In % > 2%	15/60 min	Major
Message:	**Too many errors in**		
Description:	The router or switch has too many errors when it is receiving frames.		
Recommendations:	• Identify which interfaces are having the errors. If all of the LAN/WAN interfaces to the router or switch are being monitored on by eHealth using the appropriate Failure profiles, then a similar alarm should have been raised on the failing interface. • Errors In often include frames that are corrupted in transmission. • Errors In often include errors encountered within the receiving interface hardware/software.		
Router, **Router with CPU**	TOT, Errors Out % > 2%	15/60 min	Major
Message:	**Too many errors out**		
Description:	The router or switch has too many errors when it is sending frames.		
Recommendations:	• Identify which interfaces are having the errors. If all of the LAN/WAN interfaces to the router or switch are being monitored on by EHealth using the appropriate Failure profiles, then a similar alarm should have been raised on the failing interface. • Errors Out often include errors encountered within the sending interface hardware/software.		
Router CPU **Switch CPU**	TOT, Free Memory < 2000000 bytes	15/60 min	Major
Message:	**Free memory too low**		
Description:	The amount of free memory is too low.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Recommendations:	• Add more memory. • Free reserved memory.		
Router CPU	PFM, Total Buffers outside 10% from mean	15/60 min	Warning
Message:	**Configuration change - Total Buffers**		
Description:	The total number of buffers used to hold frames within the router or switch is often controlled by configuration choices. Thus a change in the total buffers signals a change in the configuration. This may not be a problem.		
Recommendations:	• This alarm is for information only. It may point to a configuration change that caused memory related problems in the router or switch.		
Router CPU	TOT, Buffer Misses > 0.01 misses/sec	15/60 min	Warning
Message:	**Misconfigured buffers - Router buffer misses**		
Description:	On Cisco routers and switches, memory buffers come in different sizes to hold different size frames when they are received. For example, when a small frame is received, and all the small buffers are busy, the router will count this as a small buffer miss, and use a larger sized buffer to hold the frame.		
Recommendations:	• Buffer misses do not cause frames to be discarded, unless all the buffers are full. Check for Discards In. • Buffer misses indicate a small decrease in efficiency of memory usage, and slightly more processing of the frames forwarded. • Buffer misses indicate that not enough memory has been allocated to that size buffer pool. Increase the number of buffers allocated to the pool.		
Router CPU **Switch CPU**	TOT, Fan Status > 2.5	1/60 min	Major
Message:	**Fan Failed**		
Description:	The fan in the switch has failed.		
Recommendations:	• Fix or replace the fan.		
Router CPU **Switch CPU**	TOT, Fan Status > 1.5	30/60 min	Minor
Message:	**Fan Marginal**		
Description:	The fan in the switch is marginal, and is in danger of failing.		
Recommendations:	• Fix or replace the fan.		
Router CPU **Switch CPU**	TOT, Power Supply 1 Status > 2.5	1/60 min	Major
Message:	**Power Supply 1 Failed**		
Description:	Power supply #1 in the router or switch has failed. If this is the only power supply, or the other one has failed as well, the router will go down when it runs out of battery power.		
Recommendations:	• Fix or replace the power supply.		
Router CPU **Switch CPU**	TOT, Power Supply 1 Status > 1.5	30/60 min	Minor
Message:	**Power Supply 1 Marginal**		
Description:	Power supply #1 is marginal.		
Recommendations:	• Fix or replace the power supply.		
Router CPU **Switch CPU**	TOT, Power Supply 2 Status > 2.5	1/60 min	Major
Message:	**Power Supply 2 Failed**		
Description:	Power supply #2 in the router or switch has failed. If this is the only power supply, or the other one has failed as well, the router will go down when it runs out of battery power.		
Recommendations:	• Fix or replace the power supply.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Router CPU **Switch CPU**	TOT, Power Supply 2 Status > 1.5	30/60 min	Minor
Message:	**Power Supply 2 Marginal**		
Description:	Power supply #2 is marginal.		
Recommendations:	• Fix or replace the power supply.		
Router CPU **Switch CPU**	TOT, Temperature Status > 2.5	1/60 min	Major
Message:	**Critical High Temperature**		
Description:	The temperature is too high.		
Recommendations:	• Check the air conditioning in the room where the router is located. • Check the fan in the router. • Lower the temperature. • If all else fails, shut down the router or switch.		
Router CPU **Switch CPU**	TOT, Temperature Status > 1.5	30/60 min	Minor
Message:	**Marginal Temperature**		
Description:	The temperature is marginal, and may soon be too high.		
Recommendations:	• Check the air conditioning in the room where the router is located. • Check the fan in the router. • Lower the temperature.		
Router CPU **Switch CPU**	TOT, Topology Changes > 1.5	30/60 min	Major
Message:	**Bridge (spanning tree) Topology changing**		
Description:	A change in the topology of the switched/bridged LAN has caused the spanning tree to change. This bridge or switch has received a spanning tree change announcement from another switch. When the spanning tree changes, the switch/bridge may have to relearn where stations are located. While this is occurring, the bridge will forward all frames on all interfaces, thus increasing the network traffic. Under some conditions, spanning tree changes can cause frames to be discarded at the switch.		
Recommendations:	• Check other switches in the extended, switched LAN too if any which switch or bridge has gone down. • Check the discards to see if the switch discarded a large number of frames as a result of the topology change. • Some topology changes are caused by a switch temporarily losing communications with a neighboring switch. Check to see if any interfaces on this switch are discarding too many frames, or have errors.		

7.3 Router or Switch – Unusual Workload Profile

Table 25 Router or Switch – Unusual Workload

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Router	(DFM, Frames In above 99.9%) AND (PFM, Frames in above 25%) (DFM, Frames In above 99.9%) AND (PFM, Frames in above 25%)	15/60 min	Warning
Message:	**Unusually high frames in** **Unusually high frames out**		
Description:	The number of frames in or out is unusually high. The alarm is raised only if the frames are 25% above the mean. Refer to section 12.1.		
Recommendations:	• Drilldown to a Trend report to compare the current usage with the baseline. • Drilldown to an AAG report for this router to see if any related changes have occurred. • For a router, where the number of frames out should be roughly the number of frames in, these alarms will normally be raised together. • For a switch, where the switch receives many frames which are not forwarded, the two alarms are independent. • Any router or switch has a limit on the number of frames it can forward.		
Router CPU	(DFM, CPU Utilization above 99%) AND (PFM, CPU Utilization above 25%)	15/60 min	Warning
Message:	**Unusually high CPU utilization**		
Description:	The amount of CPU utilization out is unusually high. The alarm is raised only if the CPU utilization is 25% above the mean. Refer to section 12.1.		
Recommendations:	• Drilldown to a Trend report to compare the current usage with the baseline. • Run an AAG report for this router to see if any related changes have occurred. • If the CPU Utilization is too high, refer to the discussion of the CPU Utilization too high in **Error! Reference source not found.** for recommendations.		
Router CPU	(DFM, Buffers Used above 99%) AND (PFM, Buffers Used above 25%)	15/60 min	Warning
Message:	**Unusually high buffers used**		
Description:	The number of buffers used is unusually high. The alarm is raised only if the number of buffers used is 25% above the mean. Refer to section 12.1.		

Recommendations:	• Drilldown to a Trend report to compare the current usage with the baseline.
	• Run an AAG report for this router to see if any related changes have occurred.
	• If too many buffers are used,
	  • If there are any interfaces which have a high Bandwidth Utilization Out, increase the speed of the interface to lower the number of buffers needed to hold frames forwarded out the interface.
	  • Increase the memory allocated to buffers, this may require increasing the memory in the router or switch.		

Router CPU	(DFM, Free Memory below 99%) AND (PFM, Free Memory below 25%)	15/60 min	Warning
Message:	**Unusually low free memory**		
Description:	The amount of free memory is unusually low. The alarm is raised only if the free memory is 25% below the mean. Refer to section 12.1.		
Recommendations:	• Drilldown to a Trend report to compare the current usage with the baseline. • Run an AAG report for this router to see if any related changes have occurred. • If the free memory is too low, refer to the discussion of the Free memory too low alarm in **Error! Reference source not found.** for recommendations.		
Switch Plus Backplane	(DFM, Backplane Utilization above 99%) AND (PFM, Backplane Utilization above 25%)	15/60 min	Warning

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Message:	**Unusually high backplane utilization**		
Description:	The amount of backplane utilization out is unusually high. The alarm is raised only if the backplane utilization is 25% above the mean. Refer to section 12.1.		
Recommendations:	• Drilldown to a Trend report to compare the current usage with the baseline. • Run an AAG report for this switch to see if any related changes have occurred. • If the backplane utilization is too high, refer to the discussion of the backplane utilization too high in **Error! Reference source not found.** for recommendations.		

8 Server Profiles

Three profiles are provided for servers. These profiles apply to any server.

- Server – Delay, see Table 26.
- Server – Failure, see Table 27.
- Server – Unusual Workload, see Table 28.

8.1 Server – Delay Profile

Server performance can be delayed by any of the following 5 components:

1. The CPU and its speed in executing instructions.
2. The disk I/O subsystem, which reads and writes data to disks.
3. The memory subsystem, including physical and virtual memory.
4. Partition (or File System) capacity.
5. Network I/O bandwidth.

Alarm rules for each of these components are included in the Server – Delay profile.

Table 26 Server - Delay

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Generic Server **Managewise Server** **Insight Manager Server** **BMC NT Server** **BMC Unix Server** **Empire Unix Server** **Empire NT Server**	TOT, CPU Imbalance > 10	15/60 min	Minor
Message:	**CPU Imbalance**		
Description:	In a server with more than one CPU, CPU Imbalance measures how well the workload is balanced between the processors. A value of zero indicates that the CPUs all have the same CPU utilization, while a value of 100 means the CPUs all have maximally different CPU utilization's. If a 2 processor system has one processor with 100% utilization, while the other has 0% utilization, then that system has a CPU Imbalance of 100. In such a case, the benefit of having a second CPU is lost.		
Recommendations:	• Examine the CPU Utilization of all the processors. In particular, look at the time spent in User versus System time. In some operating systems or certain hardware configurations, one processor handles most or all of the hardware interrupts. If such a system is spending a lot of time in System mode, the processor load may be imbalanced. Changes to the hardware or operating system may be able to resolve this problem.		
Generic Server **BMC NT Server** **BMC Unix Server** **Empire Unix Server** **Empire NT Server**	TOT, Pages Paged In > 10 pages/sec	15/60 min	Minor
Message:	**Paging too high**		
Description:	On NT systems, the Pages Paged In measures the rate pages are paged in from paging files on disk to physical memory due to a page fault by a process. Because the time it takes to page in a page is so high, and because any page paged in causes a disk I/O, too high Pages Paged In indicate the system's virtual memory system is in trouble.		
Recommendations:	• If the system is low on physical memory, add more memory.		
Empire NT Server	TOT, Free Memory < 4000000	15/60 min	Minor
Message:	**Available memory too low**		
Description:	Windows NT attempts to keep 4 Mbytes of available memory at all times. Available memory is free physical memory, i.e., memory not dedicated to the operating system or any process.		
Recommendations:	• Add physical memory. • Examine applications to see if they can make more efficient use of memory or if they can localize their memory use.		
Empire Unix Server	TOT, Load Average > 2	15/60 min	Minor
Message:	**Load average too high**		
Description:	The 5 minute load average on Unix systems is a measure of the length of the process run queue. It measures how many processes are running, or would like to run. When the load average is high, processes must wait to get their turn to use a processor.		
Recommendations:	• Add an additional processor. • Move some of the users to a different machine to split the load. • If the user time is high, examine the applications to see if they can be optimized.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Empire Unix Server	TOT, Pages Scans > 200 pages scanned/sec	15/60 min	Minor
Message:	**Page scans too high**		
Description:	On Unix systems, in particular on Solaris, when the operating system is running short of free physical memory it "scans" pages to see if they are candidates to be paged out to swap space. The rate at which the operating system scans pages measures how frantic the operating system is to free memory. On Unix, any form of I/O causes a page fault, and so the page fault rate can be a misleading indicator of memory problems. A system performing well and doing a lot of I/O can have a high page fault rate.		
Recommendations:	• Add physical memory. • Examine applications to see if they can make more efficient use of memory or if they can localize their memory use.		
Generic Server **Managewise Server** **Insight Manager Server** **BMC NT Server** **BMC Unix Server** **Empire Unix Server** **Empire NT Server**	TOT, Average CPU Utilization > 90%	15/60 min	Minor
Message:	**CPU too busy**		
Description:	The CPUs on the server are too busy as measured by their average CPU Utilization. If the processors are too busy, the CPU run queue length often grows and user requests are delayed. Refer to section 12.5 for a discussion.		
Recommendations:	• Add an additional processor. • Move some of the users to a different machine to split the load. • If the user time is high, examine the applications to see if they can be optimized.		
Server Disk	TOT, Disk I/O Utilization > 50%	15/60 min	Minor
Message:	**Disk too busy**		
Description:	The Disk I/O Utilization measures the percentage of time a disk is busy transferring data to or from the disk. When the disk is too busy, the disk queue grows and transfers must wait their turn to use the disk. Disk I/Os can result from application or system activity, or from paging.		
Recommendations:	• If the system is paging, try to fix that problem first. • Split the workload (as measured by disk reads and writes) equally across multiple disks. For example, if the transfers are related to paging, set up swap or paging files on another disk. Striping a file system across multiple disks can also spread I/Os across multiple disks. • Examine the applications to see if they can use the disk more efficiently. • Add another disk. Consider adding a separate disk control for the disk.		
Server Disk	TOT, Disk Queue Length > 2	15/60 min	Minor
Message:	**Disk queue too long**		
Description:	Disk Queue Length measures the length of the queue of I/Os waiting or using the disk. As the disk queue grows, the time an I/O must wait for other I/Os to complete grow as well. This slows all disk operations, and slows the response time of any application that performs I/O.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Recommendations:	• If the system is paging, try to fix that problem first. • Split the workload (as measured by disk reads and writes) equally across multiple disks. For example, if the transfers are related to paging, set up swap or paging files on another disk. Striping a file system across multiple disks can also spread I/Os across multiple disks. • Examine the applications to see if they can use the disk more efficiently. • Add another disk. Consider adding a separate disk control for the disk.		
NT Process Set	TOT, Total Page Faults > 25	15/60 min	Minor
Message:	**Page faults too high**		
Description:	The page fault rate is high for this process set.		
Recommendations:	•		

8.2 Server – Failure Profile

Table 27 Server - Failure

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Generic Server **Managewise Server** **Insight Manager Server** **BMC NT Server** **BMC Unix Server** **Empire Unix Server** **Empire NT Server**	Availability	30 min	Critical
Message:	**Server Down**		
Description:	The server went down and has come back up. This alarm will be cleared after the system has been up for the window period.		
Recommendations:	•		
Generic Server **Managewise Server** **Insight Manager Server** **BMC NT Server** **BMC Unix Server** **Empire Unix Server** **Empire NT Server**	Reachability	30 min	Critical
Message:	**Server Unreachable**		
Description:	A server is unreachable if eHealth gets no response to a series of pings of the server, or if eHealth is unable to poll the device using SNMP. The server may be down, the network path to the server may be down, or the SNMP agent on the server may not be functioning. This alarm will be cleared after the server is reachable for the window period.		
Recommendations:	• If the Unreachable alarm is followed by a Down alarm, the server went down. • Ping the server. If it is reachable via ping, the network path is now up. • Examine a trend chart of latency to the server leading up to the failure. If the latency was growing, and approaching the ping timeout, then the network may be so slow that eHealth is failing to reach the device within the timeout period. In that case, you should solve the delay problem. You could increase the ping timeout. • If ping fails, examine routers along the route to the device to see if any are down, or unreachable. • Look at the polling status window to see if eHealth encountered problems in polling the device and correct them.		
Unix Process Set **NT Process Set**	Availability	30 min	Critical
Message:	**Process set down**		
Description:	The process set is down if any of its critical processes are down.		
Recommendations:	• Restart the application.		
Generic Server	TOT, Virtual Memory Utilization > 90%	15/60 min	Major
Message:	**Virtual Memory Usage too high**		
Description:	The virtual memory utilization is too high. If the server should use all its virtual memory, the server could crash, stop, or otherwise suffer a critical failure.		
Recommendations:	• Increase the size of virtual memory available to the server. • Lower the virtual memory used, either by removing applications, or lowering the virtual memory used by some applications.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
BMC Unix Server **Empire Unix Server**	TOT, Virtual Memory Utilization > 90%	15/60 min	Major
Message:	**Swap Space usage too high**		
Description:	The swap space utilization is too high. If the server should use all its swap space, the server could crash, stop, or otherwise suffer a critical failure.		
Recommendations:	• Increase the swap space available to the server, either increase existing swap space, or add new swap space on other disks. • Lower the memory used, either by removing applications, or lowering the memory used by some applications.		
Empire NT Server	TOT, Virtual Memory Utilization > 90%	15/60 min	Major
Message:	**Paging File usage too high**		
Description:	The paging file utilization is too high. If the server should use all its page file space, the server could crash, stop, or otherwise suffer a critical failure.		
Recommendations:	• Increase the size of page files available to the server. Either increase the page file size on existing disks, or add new page files on disks that do not have page files. • Lower the memory used by the system, either by removing applications, or by lowering the memory used by some applications.		
User Partition, **System Partition**	TOT, Inode Utilization > 95%	5/60 min	Major
Message:	**Running out of inodes**		
Description:	Inodes are data structures on disk used in Unix file systems to hold a description of the file. The number of inodes, and hence the maximum number of files that can be held in a file system is set when the file system is made. Running out of inodes will prevent new files from being created on the file system.		
Recommendations:	• Increase the number of inodes on this file system. • Free inodes by deleting or moving small files to another disk.		
User Partition, **System Partition**	TOT, File Allocation Failures > 0	5/60 min	Major
Message:	**File allocation failures**		
Description:	A user could not allocate a file on a file system.		
Recommendations:	•		
User Partition **System Partition**	TODT, Partition Utilization > (100% - 99.9th percentile)	5/60 min	Major
Message:	**Partition running out of space**		
Description:	LiveExceptions measures the normal variation in disk space used over the past 6 week long baseline period. This 99.9th percentile variation is then used as the threshold of the amount of free space that should be left on the disk.		
Recommendations:	• Increase the amount of space available on this disk. • Lower the disk space used by moving files to another disk.		

8.3 Server – Unusual Workload

Table 28 Server - Unusual Workload

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Empire Unix Server, Empire NT Server	• (DFM, Processes above 99.9 percentile) AND (PFM, Processes above by 10%) • (DFM, Processes below 99.9 percentile) AND (PFM, Processes below by 10%)	15/60 min	Warning
Message:	• **Unusually high processes** • **Unusually low processes**		
Description:	The number of processes running on the system is unusually high, or unusually low. The number of processes must be at least 10% above the mean to raise the alarm, refer to section 12.1.		
Recommendations:	• If the number of processes are unusually high, a new application may be running. • If the number of processes is unusually low, an application may be down.		
Server CPU	(DFM, CPU System Utilization > 99.9 percentile) AND (PFM, CPU System Utilization 10% above mean)	15/60 min	Warning
Message:	**Unusually high CPU system utilization**		
Description:	The CPU System (or Kernel) Utilization is unusually high. System Utilization measures the percent of time the CPU is busy performing system functions such as I/O, scheduling, handling interrupts, or processing system calls. The CPU System (or Kernel) Utilization must be at least 10% above the mean to raise the alarm, refer to section 12.1.		
Recommendations:	• Systems that are I/O bound, or busy processing interrupts often show a high CPU System Utilization.		
Server CPU	• (DFM, CPU Idle Utilization > 99.9 percentile) AND (PFM, CPU Idle Utilization 10% above mean)	15/60 min	Warning
Message:	• **Unusually high CPU IO wait time**		
Description:	For Unix systems, the CPU IO Wait Utilization is unusually high. The CPU I/O Wait Utilization measures the percent of time the CPU is idle waiting for an I/O operation to complete. The CPU IO Wait Utilization must be at least 10% above the mean to raise the alarm, refer to section 12.1.		
Recommendations:	• Unix systems that are waiting for I/O are busy are wasting time.		
Empire Unix Server, Empire NT Server	• (DFM, Processes above 99.9 percentile) AND (PFM, Processes above by 10%) • (DFM, Processes below 99.9 percentile) AND (PFM, Processes below by 10%)	15/60 min	Warning
Message:	• **Unusually high processes** • **Unusually low processes**		
Description:	The number of processes running on the system is unusually high, or unusually low. The number of processes must be at least 10% above the mean to raise the alarm, refer to section 12.1.		
Recommendations:	• If the number of processes are unusually high, a new application may be running. • If the number of processes is unusually low, an application may be down.		
Empire Unix Server, Empire NT Server	• (DFM, Processes above 99.9 percentile) AND (PFM, Processes above by 10%) • (DFM, Processes below 99.9 percentile) AND (PFM, Processes below by 10%)	15/60 min	Warning
Message:	• **Unusually high processes** • **Unusually low processes**		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Description:	The number of processes running on the system is unusually high, or unusually low. The number of processes must be at least 10% above the mean to raise the alarm, refer to section 12.1.		
Recommendations:	• If the number of processes are unusually high, a new application may be running. • If the number of processes is unusually low, an application may be down.		

9 RAS, Modem, ISDN, Modem Pool

These profiles are yet to be described.

9.1 Remote Access – Delay Profile

Table 29 Remote Access – Delay

Element Type	Rule, Trend Variable, Threshold	Window	Severity
RAS **Message:** **Description:** **Recommendations:**	TOT, Modems Busy % > 95% **Modems over used** •	15/60 min	Minor
Modem Pool **Message:** **Description:** **Recommendations:**	TOT, Modems Busy % > 95% **Modems over used** •	15/60 min	Minor
RAS **Message:** **Description:** **Recommendations:**	TOT, Discarded Frames % > 5% **Too many discards on dial-in connections** •	15/60 min	Minor
RAS CPU **Message:** **Description:** **Recommendations:**	TOT, CPU Utilization % > 60% **Modems over used** •	15/60 min	Minor

9.2 Remote Access – Failure Profile

Table 30 Remote Access – Failure

Element Type	Rule, Trend Variable, Threshold	Window	Severity
RAS	Availability	30 min	Critical
Message:	**Remote Access Server Down**		
Description:			
Recommendations:	•		
RAS	Reachability	30 min	Critical
Message:	**Remote Access Server Unreachable**		
Description:			
Recommendations:	•		
RAS	TOT, Free Memory < 2000000	5/60 min	Major
Message:	**Free memory too low**		
Description:			
Recommendations:	•		
RAS	TOT, Modem Errors > 0.01 errors/sec	15/60 min	Major
Message:	**Too many modem errors**		
Description:			
Recommendations:	•		
Ethernet	TOT, Retrains > 0.05 retrains/sec	15/60 min	Major
Message:	**Too many retrains**		
Description:			
Recommendations:	•		
Ethernet	TOT, Frame Errors % > 1%	15/60 min	Major
Message:	**Too many frame errors**		
Description:			
Recommendations:	•		

9.3 Remote Access – Unusual Workload Profile

Table 31 Remote Access – Unusual Workload

Element Type	Rule, Trend Variable, Threshold	Window	Severity
RAS	• (DFM, Bits In above 99.9th percentile) AND (TOT, Connect Time % > 25%) • (DFM, Bits In above 99.9th percentile) AND (TOT, Connect Time % > 25%)	15/60 min	Warning
Message:	• **Unusually high bits in** • **Unusually high bits out**		
Description:	The number of Bits In or Out of the modems is unusually high. The second clause limits this alarm to conditions where the modems are connected more than 25% of the time.		
Recommendations:	•		
RAS	(DFM, Connect Time % above 99th percentile) AND (TOT, Connect Time % > 25%)	15/60 min	Warning
Message:	**Unusually high connect time %**		
Description:			
Recommendations:	•		
RAS	(DFM, Connections above 99th percentile) AND (PFM, Connections 50% above mean)	15/60 min	Warning
Message:	**Unusually high connections**		
Description:			
Recommendations:	•		
RAS	(DFM, Memory Utilization above 99th percentile) AND (PFM, Memory Utilization 10% above mean)	15/60 min	Warning
Message:	**Unusually high memory utilization**		
Description:			
Recommendations:	•		
RAS CPU	(DFM, CPU Utilization above 99th percentile) AND (PFM, CPU Utilization 25% above mean)	15/60 min	Warning
Message:	**Unusually high CPU utilization**		
Description:			
Recommendations:	•		
Modem Pool	(DFM, Connect Time % above 99th percentile) AND (TOT, Connect Time % > 25%)	15/60 min	Warning
Message:	**Unusually high connect time %**		
Description:			
Recommendations:	•		

10 Response Profiles

The Response – Delay profile, see Table 32, covers performance problems related to delay as well as failures. It raises alarms when the service level agreement (SLA) is violated.

Response time can be measured in two ways:

- By using a test generator agent, either the sysEdge Service Response module (SR) or the Cisco Service Assure Agent (SAA) that generates transaction attempts at regular intervals.
- By using an observational agent, the FirstSense agent (FS), which monitors user transactions and measures the actual response time the user experiences.

In either case, the agent measures response for a Response Path, from a Source to a Destination for a particular Application or Protocol.

For each response path monitored with this profile, the path's Response Limit should be set to the maximum service response time allowed by the SLA for this application or protocol. For example, say the SLA states that the maximum response time for a DNS query should by 1 second. The Response Limit for all the DNS paths should be set to 1000 milliseconds (= 1 second). You can set the Response Limit using the Path Manager in the Poller Configuration in the Network Health Console.

10.1 Response – Delay Profile

Table 32 Response - Delay

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Response Path, Application Response Path, Jitter Response Path, FirstSense Response Path, Empire Service Response Path	TOT, Response/Limit > 100%	15/60 min	Major
Message:	**Response over Limit**		
Description:	The Response time is greater than the service level agreement allows for the application or protocol.		
Recommendations:	Generic recommendations: • Check to see if the response limit has been set and that the value is reasonable. • To diagnose why response time might be slow for the path, drill down to an AAG report. • If the problem appears to be a slow network route from source to destination, diagnose and correct the problem as described in 10.2. • If the problem appears to be a slow destination (server) for an application path, look for any alarms or exceptions from the Server – Delay profile for the destination server. Specific recommendations depend on the particular kind of path. • For Cisco SAA or sysEdge SR paths measuring network protocols such as Ping, UDP Echo, or Jitter Tests: • Refer to section 10.2.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity

	• For Cisco SAA paths measuring application protocols, such as HTTP, FTP, or email:
	  • Check the response time for a network level path that parallels the application path, i.e., that has the same source and destination, but measures network delay directly using a protocol like Ping or UDP Echo.
	  • If that path is slow, suspect the delay is in the network. Refer to section 10.2.
	  • If the network is not slow, check the server:
	  • See if any alarms are active on the server.
	  • The Response Destination AAG should show if the problem is common to all paths (test sources) or specific to this path. This report can be run from the Path AAG.
	  • The Server AAG report for the server should pinpoint any problems within the server. This report can be run from the Response Destination AAG.
	  • If neither the network nor the server is causing the problem, the delay may be within the source router running the test.
	  • See if any alarms are active on the source router.
	  • The Response Source AAG should show if the problem is common to all paths whos source is the router or specific to this path. This report can be run from the Path AAG.
	  • The Router AAG report for the source system should pinpoint any problems within the router, in particular, look at the CPU utilization for the router. This report can be run from the Response Source AAG.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity

	• For sysEdge SR paths measuring application protocols, such as HTTP, FTP, or email:
	  • Drilldown to an AAG report to determine if the bulk of response time is in the DNS lookup time, TCP Connect Time, or the actual Transaction Time.
	  • If the DNS Lookup Time is long:
	  • Check to see if the DNS Server is working properly.
	  • Check the response time for a path from this source SR agent to the DNS server to see if DNS is slow.
	  • If the TCP Connect Time is long, the delay may be in the network.
	  • Check the response time for a network level path that parallels the application path, i.e. has the same source and destination, but measures network delay directly, using a protocol like Ping or UDP Echo.
	  • If that path is slow, suspect the delay is in the network. Refer to 10.2.
	  • If the network is not slow, check the server:
	  • See if any alarms are active on the server.
	  • The Response Destination AAG should show if the problem is common to all paths (test sources) or specific to this path. This report can be run from the Path AAG.
	  • The Server AAG report for the server should pinpoint any problems within the server. This report can be run from the Response Destination AAG.
	  • If neither the network nor the server is causing the problem, the delay may be within the source system running the test.
	  • See if any alarms are active on the source system.
	  • The Response Source AAG should show if the problem is common to all paths (test destinations) or specific to this path. This report can be run from the Path AAG.
	  • The Server AAG report for the source system should pinpoint any problems within the system. This report can be run from the Response Destination AAG.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity

	• For Cisco SAA or sysEdge SR paths measuring network services such as DNS:
	  • Check the response time for a network level path that parallels the application path, i.e. has the same source and destination, but measures network delay directly, using a protocol like Ping or UDP Echo.
	  • If that path is slow, suspect the delay is in the network. Refer to 10.2.
	  • If the network is not slow, check the server:
	  • See if any alarms are active on the server.
	  • The Response Destination AAG should show if the problem is common to all paths (test sources) or specific to this path. This report can be run from the Path AAG.
	  • The Server AAG report for the server should pinpoint any problems within the server. This report can be run from the Response Destination AAG.
	  • If neither the network nor the server is causing the problem, the delay may be within the source system running the test.
	  • See if any alarms are active on the source system.
	  • The Response Source AAG should show if the problem is common to all paths (test destinations) or specific to this path. This report can be run from the Path AAG.
	  • The Server AAG report for the source system should pinpoint any problems within the system. This report can be run from the Response Destination AAG.
	
	• For FS paths measuring application transactions such as SAP, Oracle, or Exchange:
	  • Drilldown to an AAG report to determine if the bulk of response time is in the Client, the Server, or the Network.
	  • If the network is slow, refer to 10.2.
	  • If the server response time is slow.
	  • See if any alarms are active on the server.
	  • The Response Destination AAG should show if the problem is common to all paths (source clients) which use this server, or specific to this client. This report can be run from the Path AAG.
	  • The Server AAG report for the server should pinpoint any problems within the server. This report can be run from the Response Destination AAG.
	  • If client response time is slow:
	  • See if any alarms are active on the source system.
	  • The Response Source AAG should show if the problem is common to all paths (test destinations) or specific to this path. This report can be run from the Path AAG.
	  • If the client system is an NT system, the Empire sysEdge agent could be run on that system. A Server AAG report for the client system should pinpoint any problems within the system. This report can be run from the Response Source AAG.		

Response Path, Application Response Path, Response Path with Jitter, Empire Service Response Path	TOT, Attempts < 0.001%	15/60 min	Major

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Message:	**No attempts made**		
Description:	This rule applies only to generated test transactions. The agent made no transaction attempts. This often means a problem with the agent, or a problem with the particular test configuration.		
Recommendations:	• See if the agent is operating. • Examine any logs generated by the agent or the eHealth Statistics Poller to see if any error messages were generated.		
Response Path, Application Response Path, Jitter Response Path, Empire Service Response Path	TOT, Failed Attempts > 20%	15/60 min	Major
Message:	**Test attempts or transactions failed**		
Description:	This rule applies only to generated test transactions. Some of the test transaction attempts failed. An attempt might fail because the destination is not available or because the transaction took longer than the timeout value defined for the path.		
Recommendations:	• Drill down to an AAG report for the path. Look to see if the failed transactions happen when response is slow. In particular, look at the Maximum Response. If response is slow, diagnose the problem as described above under the Response over Limit alarm. • If the Destination Unreachable alarm is also active then the problem is likely to be related to the server, or the network path from source to destination is down.		
Response Path, Application Response Path, Jitter Response Path, Empire Service Response Path	TOT, Failed Attempts > 99.99%	15/60 min	Major
Message:	**Destination unreachable**		
Description:	This rule applies only to generated test transactions. All of the test transaction attempts failed. An attempt might fail because the destination is not available or because the transaction took longer than the timeout value defined for the path.		

Recommendations:	• Drill down to an AAG report for the path. Look to see if the failed transactions happen when response is slow. In particular, look at the Maximum Response. If response is slow, diagnose the problem as described above under the Response over Limit alarm.
	• If this is an application test (for example, DNS, HTTP, or email) determine if the network path is down, or if the server is down.
	  • To check the network path, examine a parallel path, one with the same source and destination, but for a network protocol such as a Ping or UDP Echo test.
	  • To check the destination, run an AAG for the destination, and see if all the paths are unable to reach the destination. If so, the problem is likely within the server.		

Jitter Response Path	TOT, Jitter > 10 msec	15/60 min	Major
Message:	**Too much jitter**		
Description:	The jitter measured on this path is too large. Jitter can have a severe impact on real time voice or video communications.		
Recommendations:	• Jitter is often caused by variation in queueing delays in routers, switches, along the route, or in the source or destination systems themselves. • Jitter can be controlled by giving voice and video traffic priority over data traffic in the queueing discipline used in routers and switches.		

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Response Path, Application Response Path, Jitter Response Path, Service Response Path	DFM, Response above 95 percentile	15/60 min	Warning
Message:	**Unusually slow response**		
Description:	The response time for this path is unusually slow.		
Recommendations:	• If the response time is too slow, see the recommendations for Response over Limit above. • Check to see if the network or destination is handling an unusually high workload.		
Response Path, Application Response Path, Jitter Response Path, Service Response Path	• (DFM, Minimum Response above 95 percentile) AND (PFM, Minimum Response 20% above mean) • (DFM, Minimum Response below 95 percentile) AND (PFM, Minimum Response 20% below mean)	60/120 min	Warning
Message:	• **Increased minimum response – possible route change** • **Decreased minimum response – possible route change**		
Description:	The minimum response has changed. It has either increased or decreased. Minimum response measures the response time seen when other traffic or work on the server is minimized. It is generally a stable measure of the "speed of light delay" from source to destination and back again on network protocol tests. However if the route that packets follow between source and destination changes, the minimum round trip delay may also change. This alarm is most useful on network layer tests, such as Ping or UDP Echo tests. For application tests, reconfiguration or other changes in the application server can cause this alarm.		
Recommendations:	• Check to see if the route has changed. • If the path is between adjacent routers, and the routers are connected by a Frame Relay Circuit or ATM Channel, check with the service provider to see if the routing of the circuit or channel has been reconfigured.		
Empire Service Response Path	DFM, DNS Lookup Time above 99.9 percentile	15/60 min	Warning
Message:	**Unusually slow DNS lookup time**		
Description:	The time to lookup the DNS name and translate it into an address was unusually slow.		
Recommendations:	• Check the DNS server to see if there is a problem with it.		
Empire Service Response Path	DFM, TCP Connect Time above 99.9 percentile	15/60 min	Warning
Message:	**Unusually slow TCP Connect time**		
Description:	The time taken to establish the TCP connection was unusually slow.		
Recommendations:	• Check the network from client to server to see if it is slow.		
Empire Service Response Path	DFM, Transaction Time above 99.9 percentile	15/60 min	Warning
Message:	**Unusually slow transaction time**		
Description:	The time to perform the actual transaction (once the TCP connection was established) is unusually slow.		
Recommendations:	• Check the application server to see if it is slow.		

10.2 Diagnosing a slow network path

A slow network path can be caused by delays in any link, switch, or router along the route from the source to the destination, or on the route from the destination back to the source. Alarms from the delay profiles applied to the LAN and WAN links, routers, and switches along the route should identify any delay problems caused by these network components.

To determine the route from source to destination, you can log into the source system, and perform a traceroute to the destination IP address. This will at least identify the routers along the path. With a basic knowledge of the network topology, in particular a knowledge of the WAN links between the routers, you should be able to identify the major WAN links the route traverses. Some switches (switches operating at layer 2) will not be seen by traceroute.

11 Host Latency Profiles

Two profiles are provided to detect latency problems. These profiles can be applied to any host, router, switch, server, or RAS element. The two profiles are:

- Host – Unusual Latency, Table 33.
- Host – Latency 2 second limit, Table 34.

The two profiles are designed to work together. The Unusual Latency profile adapts the threshold based on history, and thus does a good job of detecting problems that suddenly appear. However, problems that develop slowly over time, or latencies that

For most users, the latency profile can best be applied to devices, that is, Servers, Routers, Switches, and RAS. Latency measures the time to ping the IP address of the host's agent. The same ping latency is used for all the elements with that agent address.

Customers who are only monitoring LAN and WAN elements can create a custom profile which measures the latency to a LAN or WAN element. This should be applied selectively to a few LAN/WAN elements, as many of them share the same agent IP address.

Customers using alternate latency to measure the delay over a LAN/WAN link to the other end should apply a custom profile using a DFM rule to detect when the link latency changes.

Table 33 Host – Unusual Latency

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Any Host	DFM, Latency above 97.7 percentile	15/60 min	Warning
Message:	**Latency to host unusually high**		
Description:	The network delay from the EHealth poller to the host is unusually high.		
Recommendations:	• Drill down to a Trend report of Latency to see the normal range and how the current value compares to it. • If the latency is too high, determine why and correct it as described in section 10.2.		

Table 34 Host –Latency 2 second limit

Element Type	Rule, Trend Variable, Threshold	Window	Severity
Any Host	TOT, Latency > 2000 msec	15/60 min	Warning
Message:	**Latency to host too high**		
Description:	The network delay from the EHealth poller to the host is too high. The value of 2 seconds (2000 milliseconds) depends on your particular network. Depending on the size and delays typically encountered in your network, you may increase or decrease this threshold.		
Recommendations:	• Drill down to a Trend report of Latency to see the normal range, and how the current value compares to it. • If the latency is too high, determine why and correct it as described in section 10.2.		

12 Notes

This section describes notes that apply to many rules.

12.1 Compound Unusual Value Alarm Rules

Alarm rules based on Deviation from Mean detect cases where the value is unusual. However, experience has shown that many cases where the value is "unusual" are also cases where the standard deviation is very small or the workload (traffic) is low. In such cases, the mean and standard deviation of the variable is very small, and the normal range is very narrow. Any change from the mean is seen as being unusual, even though the deviation is trivial.

To correct this, many unusual workload rules compound the basic Deviation from Mean rule with a Percent from Mean or an Absolute from Mean. Which of these is used depends on the particular case:

- If the standard deviation is small and a reasonable minimum deviation can be identified, then an Absolute from Mean can be used to filter out trivial deviations from normal. For example, say we want to detect if the number of users logged in to a Unix system is unusually high. We might use the rule (DFM users above the 99.9 percentile) AND (AFM above 2). The first clause of the rule detects cases during the middle of the day when the normal number of users is 40, and the value varies from 20-60 users. The second clause covers the case where there are always four users logged on in the middle of the night, and the standard deviation is very small, less than 1. On a night when there are five users logged in, we do not want to raise an alarm. By adjusting the absolute range in the second clause, we can filter out more (or less) of these trivial changes.

- If no absolute range can be determined, we might add a filter clause using Percent from Mean to filter out trivial deviations. For example, say we want to detect if the number of page faults is unusually high. We could use the rule (DFM, Page Faults above 99 percentile) AND (PFM, Page Faults 100% above mean). The second clause filters out cases where page faults are not twice the mean.

- Some variables may change wildly when the traffic is low. For example, if a WAN link is carrying only 10 frames per second, then each error per second corresponds to an additional 10% error percentage. To detect unusual values in percentages, we could use the rule (DFM, Errors % > 95 percentile) AND (TOT, Frames > 100). The second clause discards cases where the frames per second is less than 100, which ensures that there are enough frames considered to get a reasonably accurate value for Error %.

12.2 Statistics, Percentiles, and Standard Deviations

TBS

12.3 Drilldowns

12.4 Availability and Reachability Alarms for Hosts

12.5 Utilization, Queueing, and Delay